

**Culminating Experience Action Research Projects,
Volume 10, Spring 2007**

**Edited by
Deborah A. McAllister and Sharon R. Deaver
March 27, 2008**

**College of Health, Education, and Professional Studies
The University of Tennessee at Chattanooga**

Introduction

As a part of the teacher licensure program at the graduate level at The University of Tennessee at Chattanooga (UTC), the M.Ed. Licensure candidate is required to complete an action research project during a 3-semester-hour course that coincides with the 9-semester-hour student teaching experience. This course, Education 590 Culminating Experience, requires the student to implement an action research plan designed through (a) the Education 500 Introduction to Inquiry course, (b) one of the two learning assessments required during student teaching, or (c) a newly-designed project not used as one of the learning assessments.

With funding through a UTC Teaching, Learning, and Technology Faculty Fellows award, the Education 590 course is conducted through the use of an online, course management system (Blackboard Learning System Release 6), allowing for asynchronous discussion and use of the digital drop box feature for submitting required papers.

The course syllabus for Education 590 Culminating Experience is presented in the next section, followed by action research projects from spring semester 2007.

Deborah A. McAllister

Sharon R. Deaver

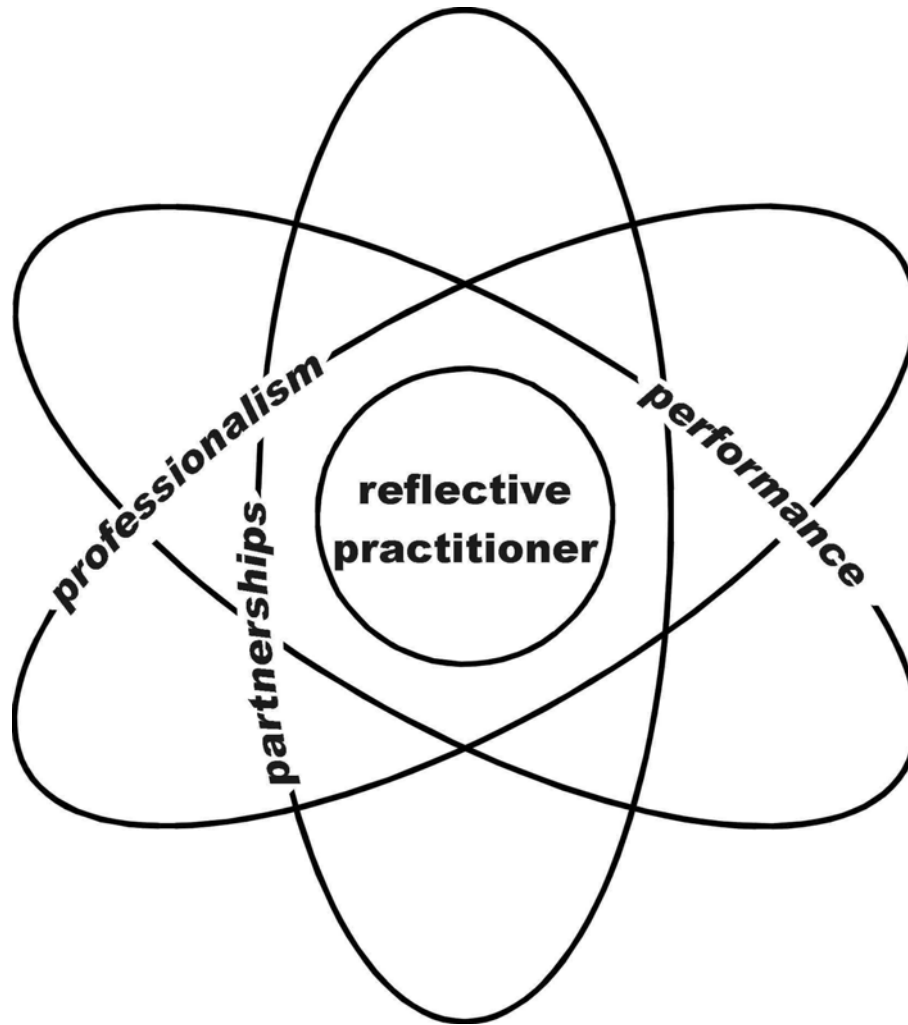
March 2008

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Educ 590 Culminating Experience
Spring 2007
Sections 001 and 002, By Appointment, 3 credit hours



ATTENTION: If you are a student with a disability (e.g., physical, learning, psychiatric, etc.) and think that you might need assistance or an academic accommodation in this class or any other class, contact the Office for Students with Disabilities at 423-425-4006 or come by the office, 110 Frist Hall.

To enhance student services, the University will use your UTC email address (firstname-lastname@utc.edu) for communications. (See <http://onenet.utc.edu/> for your exact address.) Please check your UTC email on a regular basis. If you have problems with accessing your email account, contact the Help Desk at 423-425-2678.

Educ 590 Culminating Experience – Spring 2007
Sections 001 and 002, By Appointment, 3 credit hours

Instructor

Dr. Deborah A. McAllister

Office: Hunter 310C

Office hours: M 10:00 a.m. to 5:00 p.m. and Tu 1:00 p.m. to 4:00 p.m., or by appointment

Phone: 423-425-5376 (Office), 423-842-1607 (Home)

Email: Deborah-McAllister@utc.edu

Web site: <http://oneweb.utc.edu/~deborah-mcallister/>

Graduate Assistant: Sarah Fritch

Catalog description

Directed research or development project under faculty supervision. *Prerequisite: Admission to candidacy, approval of M.Ed. committee.*

Recommended text and Web sites

American Psychological Association. (2001). *Publication manual of the American Psychological Association* (5th ed.). Washington, DC: Author.

Online Writing Lab at Purdue University. (2006). *Using APA format*. Retrieved November 27, 2006, from <http://owl.english.purdue.edu/owl/resource/560/01/>
 Degelman, D., & Harris, M. L. (2006). *APA style essentials*. Retrieved November 27, 2006, from http://www.vanguard.edu/faculty/ddegelman/index.aspx?doc_id=796
 University of Wisconsin - Madison Writing Center. (2006). *Writer's handbook: APA documentation style*. Retrieved November 27, 2006, from <http://www.wisc.edu/writing/Handbook/DocAPA.html>

Objectives

1. The student can apply a variety of research strategies for use in the elementary, middle grades, and/or secondary classroom, or with professionals in the field. Reflective decision making, a process involving reading, reflecting, and responding, will be applied by the student to evaluate ongoing research techniques, procedures, and materials, in order to become a reflective practitioner.
2. The student will select or design surveys and/or rubrics for data collection in the content area.
3. The student will understand current issues in the content area, including current research methods, materials, professional development and grant opportunities, and programs suitable to all learners, from exceptional populations to diverse ethnic and cultural groups.

4. The student will demonstrate the ability to connect new learning with prior knowledge and skills through a case study conducted during the Induction Experience (Educ 596) or the Professional Teaching Experience (Educ 591).

Requirements

1. Select a case study option:
 - a. Implementation of the project designed in Educ 500 as your case study. Include modifications to the project, if necessary, based on knowledge gained since the completion of Educ 500. Submit a corrected copy.
 - b. Plan to use one of your learning assessments from your first placement as your case study. Submit an outline of the topic, what will be assessed, who will be assessed, how and when assessment will occur, and what instruments will be used. Submit an outline.
 - c. Design a new project of your own choosing. Submit an outline for approval.
2. **Prior to data collection, complete the REQUIRED process for UTC's Institutional Review Board For the Protection of Human Research Subjects (<http://www.utc.edu/~instrb/> or <http://www.utc.edu/Administration/InstitutionalReviewBoard/>). Request either an Exemption from IRB Review (Form A) if your sample includes only adults, or an Expedited Review (Form B), if your sample includes children. Form C must be completed at the end of the study. I will print Form C for you to sign. Review the information and forms on the IRB Web site for additional details. An Exemption requires approximately 1 week to process. An Expedited Review may require several weeks to process. (Full board approval is required if there is more than minimal risk to the subject.) Any updates to the IRB process will be followed. Submit all documents to me ELECTRONICALLY through the digital drop box in Blackboard, and one [paper] signature page, with your signature; I will make the photocopies after approving your documents. Place a page break in your document such that the signature page will contain only signatures. Your instrument, consent form, and/or assent form MUST contain the following statement:**

THIS PROJECT HAS BEEN REVIEWED BY THE INSTITUTIONAL REVIEW BOARD FOR THE PROTECTION OF HUMAN SUBJECTS AT THE UNIVERSITY OF TENNESSEE AT CHATTANOOGA.

Your consent and assent forms must include contact information for Drs. McAllister and Eigenberg, and must contain an option for the participant to discontinue participation as a research subject with no penalty. (Students are still required to complete course work.)

Participation in this study is voluntary. You may discontinue your participation in the project at any time. Your decision whether or not to

participate in the project or to withdraw from the project at any time will in no way affect your academic standing in this course. If you do choose to participate in the study, your participation will be completely anonymous. No one reading the results of the research will be able to identify you. (Reword “you” as “the student,” etc., for the parental consent form.)

If you have any questions about the project, you may contact me at xxx-xxx-xxxx, Dr. Deborah McAllister, project advisor, at 423-425-5376, or the Chairperson of The University of Tennessee at Chattanooga’s Institutional Review Board for the Protection of Human Research Subjects, Dr. Helen Eigenberg, at 423-425-4270.

You must include a memo (preferably, an email attachment) from the school principal that you have permission to carry out the project.

If there is evidence of prior research that you have done or evidence stated in the literature for your project, place that on the IRB approval form (a sentence or two). If not, cite the HCDE standards that are addressed by your project so the IRB members know why you are teaching/investigating the topic. Check the IRB’s Review Status link and your email account for updates on your proposal.

3. Implementation of the project will be completed during the Induction Experience (Educ 596) or the Professional Teaching Experience (Educ 591). Implementation **cannot** occur prior to IRB approval.
4. Completion of the written project, **in APA style**. Include the following elements, each of which should be centered at the top of that section of the paper (not italic, not bold; see p. 113 in the APA style manual):
 - a. Introduction to the Problem. Why was this topic selected for study? Is this topic a current national, state, or local issue? Is this topic a staple of the curriculum in your field? Etc.
 - b. Review of Literature. Use at least five refereed sources. The online Education Resources Information Center (ERIC) advanced search should be used to locate references in educational journals and documents. See ERIC (<http://www.eric.ed.gov/>) and/or select the link to the advanced search. **You must use a page number or a paragraph number for all direct quotes. All references should contain complete page numbers (not the first page only, as may be listed in online documents).**
 - c. Data Collection and Results. Describe data collection procedures. Provide results of the project, in narrative form and including a chart and/or graph to display the data collected. Analysis of results is from the perspective of higher order cognitive skills. Use descriptive statistical measures (mean, median, mode, frequency distribution, charts, graphs, etc.) for communication of project results. Charts and graphs are imported from Excel to Word and cited

as tables and figures. See Microsoft Excel [spreadsheet] software, used in Educ 575.

- d. Conclusions and Recommendations. What generalizations, if any, can be made, based on the results of the case study? What is the consensus of your professional organization with regard to the problem studied? What recommendations would you make for teacher professional development? Is grant money available to support further research in this area? What role could be assumed by the use of technology in this area? **Please address all items in this section.**
 - e. Copies of the instrument(s) used for data collection. Place original instruments in individual appendices. Do not include published instruments from the Web, books, etc., but place a citation on the page that mentions an instrument and in the reference list.
5. Communication:
 - 1) Current email address registered with UTC for communication between student and instructor. The UTC email address will point to the email address you have on file. See <http://itd.utc.edu/email/> for more details.
 - 2) Web access to check course announcements and post messages to the discussion forum on Blackboard a minimum of once per week. See <http://bb2.utc.edu/>.
 6. All work is to be computer-generated and turned in through the Blackboard digital drop box. You may complete your project either on the Macintosh or Windows platform. Please use Microsoft Word and Microsoft Excel. If other software is to be used, please ask for approval. Keep a copy of your work on a hard drive or a disk so that it can be accessed, if needed. Reminder: You will need a student ID card to use the university student lab in the University Center.
 7. Please note:
 - a. Ask another person to proofread your work for correct syntax and semantics before submitting it. You are encouraged to post it to the Blackboard discussion forum.
 - b. The Writing Center is located in 119 Holt Hall. See <http://www.utc.edu/~scribble/> for hours and information.
 - c. Case studies may be displayed at a professional meeting and/or gathered for a publication.
 8. Previously published student papers:

McAllister, D. A., & Bothman, S. M. (Eds.). (2005). *Culminating experience action research projects, volume 6, fall 2004*. (ERIC Document Reproduction Service No. ED490689)

McAllister, D. A., & Bothman, S. M. (Eds.). (2005). *Culminating experience action research projects, volume 5, spring 2004*. (ERIC Document Reproduction Service No. ED490030)

- McAllister, D. A., & Bothman, S. M. (Eds.). (2005). *Culminating experience action research projects, volume 4, fall 2003*. (ERIC Document Reproduction Service No. ED490668)
- McAllister, D. A., & Moyer, P. S. (Eds.). (2003). *Culminating experience action research projects, volume 3, spring 2003*. (ERIC Document Reproduction Service No. ED481396)
- McAllister, D. A., & Moyer, P. S. (Eds.). (2002). *Culminating experience action research projects, volume 2, fall 2002*. (ERIC Document Reproduction Service No. ED474071)
- McAllister, D. A., Moyer, P. S., & Bothman, S. M. (Eds.). (2005). *Culminating experience action research projects, volume 1, spring 2002*. (ERIC Document Reproduction Service No. ED490720)

Grading rubric

Criteria	A	B	C	F
Project outline and IRB approval	Submitted online. Submitted for IRB approval; approval received.	Submitted online. Submitted for IRB approval; approval received.	Submitted online. Submitted for IRB approval; approval received.	Not submitted online. Not submitted for IRB approval, or IRB approval denied.
Instruments	Items appear to be reliable and valid for the case study.	Items appear to be reliable and valid for the case study.	Reliability or validity is questionable.	Reliability and validity cannot be defended.
Data collection and results	Narrative gives descriptive account of data collection and results, and higher order analysis of results; data chart and graph display results accurately and appropriately.	Narrative provides descriptive account of data collection and results, but analysis of results is weak; data chart and graph display results satisfactorily.	Narrative provides limited descriptive account of data collection and results; analysis of results is flawed; data chart and graph display results, but contain errors.	Neither narrative nor chart and graph convey the data collection procedures and results of the study.
Conclusions and recommendations	Provides a cohesive summary to the project; all recommendation areas addressed satisfactorily.	Provides a cohesive summary to the project; most recommendation areas addressed satisfactorily.	Summary lacks insight to the intent of the project; recommendation areas not completely addressed.	Conclusions do not reflect results; recommendation areas not completely addressed.
APA style	APA style elements present: headings, subject-verb agreement, citations, references, abbreviations, commas, semicolons, lists, tables, figures, appendices, etc.	APA style elements present, with minor errors.	Ideas are understandable; acceptable writing style, though not APA.	Written style is inconsistent; difficult to follow the flow of ideas.
Spelling and typographical errors	No spelling errors; minimal typographical errors; correct use of plural and possessive forms.	Spelling and typographical errors present.	Errors detract from quality of project.	Poorly written.
Completion time	All elements completed on time.	Major elements completed on time; some minor elements late.	Most major elements completed late; some or most minor elements late.	No time deadline.
Communication	Open communication between student and instructor. Progress message posted to the discussion forum at least	Response time is less than once each week.	Response time is less than once in 2 weeks	Response time is less than once in 4 weeks.

	Weekly.			
Professional quality and usefulness	Previous and current suggestions, and modifications, fully incorporated into project outline; project is relevant to education.	Previous and current suggestions, and modifications, selectively incorporated into project outline; project is relevant to education.	Previous and current suggestions, and modifications, minimally incorporated into project outline; project is relevant to education.	Previous and current suggestions, and modifications, not incorporated into project outline; project has little relevance to education.
Represents graduate level work	Completed project is presented as a coherent whole.	All project elements present but project is not presented as a coherent whole.	One or more project elements missing; project is not presented as a coherent whole.	Major project elements missing; project is not presented as a coherent whole.

Week (Tentative course schedule, subject to change.)**Assignment due**

- 1 Week of 01/08/07 (and prior meeting 12/05/06) Check email account; access Blackboard.
M 01/08, Student teacher meeting; W 01/10, 1st placement begins Educ 590 will meet 01/08.
- 2 Week of 01/15/07; Martin Luther King Holiday, M 01/15 (UTC/HCDE)
Case study option selected; proposed outline posted to discussion forum.
Paperwork submitted for IRB approval. Instruments and letter of approval from school principal must be included with both Form A and Form B. Parental consent form and student assent form must be included with Form B. Participant consent form must be included with Form A. Copy of IRB approval placed in my mailbox in Hunter 311, when received, if not sent by email.
- 3 Week of 01/22/07
Begin case study work on introduction, review of literature, and instruments;
place file in digital drop box for review and for a check of APA style.
- 4 Week of 01/29/07 Begin data collection, with IRB approval.
- 5 Week of 02/05/07 Case study work continues.
- 6 Week of 02/12/07 Case study work continues.
- 7 Week of 02/19/07; Presidents' Day Holiday, M 02/19 (HCDE) Data collection is complete.
- 8 Week of 02/26/07; 1st placement ends (?) Writing of case study.
- 9 Week of 03/05/07; Second placement begins (?) Writing of case study.
- 10 Week of 03/12/07; Spring break (UTC) Writing of case study.
- 11 Week of 03/19/07; Spring break (HCDE) Writing of case study.
- 12 Week of 03/26/07 Writing of case study.
- 13 Week of 04/02/07; Spring Holiday, F 04/06 (UTC/HCDE) Writing of case study.
- 14 Week of 04/09/07 Proofreading of case study.
- 15 Week of 04/16/07 **Completed case study due, Sa 04/21/07, 12:00 p.m. (noon)**
Case study assembled in a single file; placed in digital drop box.
- 16 Week of 04/23/07; Second placement ends, M 04/23; Student teacher meeting, Tu 04/24
Late case studies accepted. IRB Form C completed when we meet. (I will provide Form C.)

17 Week of 04/30/07; Th 05/04, Grades due, 12:00 p.m.; Su 05/06, Commencement, 2:00 p.m.

Late case studies accepted; not guaranteed to be graded by 05/04.

APA style (general guidelines; use reverse indent)

1. Journal

Last name, Initials., & Last name, Initials. (year). Title of the article in lower case letters except first letter of the title and proper nouns. *Journal name, volume*(number), page number-page number.

Many, W., Lockard, J., Abrams, P., & Friker, W. (1988). The effect of learning to program in Logo on reasoning skills of junior high school students. *Journal of Educational Computing Research, 4*(2), 203-213.

2. Book

Last name, Initials., & Last name, Initials. (year). *Title of the book in lower case letters except first letter of the title and proper nouns.* Place of publication: Publishing Company.

Turner, T. N. (1994). *Essentials of classroom teaching elementary social studies.* Needham Heights, MA: Allyn and Bacon.

3. Software

Last name, Initials., & Last name, Initials. (year). *Title of the Software in Upper Case First Letters* [Computer software]. Place of publication: Publishing Company.

Microsoft Corporation. (1996). *Encarta 97 Encyclopedia* [Computer software]. Redmond, WA: Author.

In example 3, the author and the publishing company are the same, so the word 'Author' is used.

4. Online source

Last name, Initials., & Last name, Initials. (year). *Title of the Web site in lower case letters except first letter of the title and proper nouns.* Retrieved today's date, from complete URL

National Council of Teachers of Mathematics. (2000). *Principles and standards for school mathematics.* Retrieved November 27, 2006, from <http://standards.nctm.org/>

In example 4, I omit the period '.' at the end so it will not be confused in the address. Others choose to leave one space, then place the period at the end of the URL.

5. ERIC document

Last name, Initials., & Last name, Initials. (year). *Title of the paper in lower case letters except first letter of the title and proper nouns.* Paper presented at name, place, and date of conference, or other relevant information. (ERIC Document Reproduction Service No. XXXXXX)

McAllister, D. A., Mealer, A., Moyer, P. S., McDonald, S. A., & Peoples, J. B. (2003). *Chattanooga math trail: Community mathematics modules, volume 1*. Washington, DC: U.S. Copyright Office. (ERIC Document Reproduction Service No. ED478915)

Professional Organizations (examples)

American Council on the Teaching of Foreign Languages. (n.d.). Retrieved November 27, 2006, from <http://www.actfl.org/>

Council for Exceptional Children. (2006). Retrieved November 27, 2006, from <http://www.cec.sped.org/>

International Reading Association. (2007). Retrieved November 27, 2006, from <http://www.reading.org/>

International Society for Technology in Education. (n.d.). Retrieved November 27, 2006, from <http://www.iste.org/>

National Art Education Association. (2005). Retrieved November 27, 2006, from <http://www.naea-reston.org/>

National Association for Music Education. (n.d.). Retrieved November 27, 2006, from <http://www.menc.org/>

National Association for the Education of Young Children. (n.d.). Retrieved November 27, 2006, from <http://www.naeyc.org/>

National Council for the Social Studies. (n.d.). Retrieved November 27, 2006, from <http://www.ncss.org/>

National Council of Teachers of English. (2006). Retrieved November 27, 2006, from <http://www.ncte.org/>

National Council of Teachers of Mathematics. (2006). Retrieved November 27, 2006, from <http://www.nctm.org/>

National Middle School Association. (2006). Retrieved November 27, 2006, from <http://www.nmsa.org/>

National Science Teachers Association. (2006). Retrieved November 27, 2006, from <http://www.nsta.org/>

Rubrics (examples)

Chicago Public Schools. (2000). *The rubric bank*. Retrieved November 27, 2006, from http://intranet.cps.k12.il.us/Assessments/Ideas_and_Rubrics/Rubric_Bank/rubric_bank.html

Chicago Public Schools. (2000). *How to create a rubric*. Retrieved November 27, 2006, from http://intranet.cps.k12.il.us/Assessments/Ideas_and_Rubrics/Create_Rubric/create_rubric.html

LessonPlanZ.com. (2005). Retrieved November 27, 2006, from <http://lessonplanz.com/> (use 'rubric' as a search term)

South Dakota State University. (n.d.). *Rubric template*. Retrieved November 27, 2006, from http://edweb.sdsu.edu/triton/july/rubrics/Rubric_Template.html

Teachnology. (n.d.). Rubric, rubrics, teacher rubric makers. Retrieved November 27, 2006, from http://teachers.teach-nology.com/web_tools/rubrics/

The Landmark Project. (n.d.). *Rubric construction set*. Retrieved November 27, 2006, from <http://landmark-project.com/classweb/rubrics/4x4rubric.html>

Surveys (examples)

The International Consortium for the Advancement of Academic Publication. (2006). *Resources for methods in evaluation and social research*. Retrieved November 27, 2006, from <http://gsociology.icaap.org/methods/>

University of Southern Indiana Sociology Department. (2006). *Social research and statistical links*. Retrieved November 27, 2006, from <http://www.usi.edu/libarts/socio/stats.htm>

Bibliography

American Association for the Advancement of Science. (1993). *Benchmarks for science literacy*. Retrieved November 27, 2006, from <http://www.project2061.org/tools/benchol/bolintro.htm>

Association of College and Research Libraries. (2006). *Information literacy competency standards for higher education*. Retrieved November 27, 2006, from <http://www.ala.org/acrl/ilstandardlo.html>

Creswell, J. W. (2005). *Research design: Planning, conduction, and evaluating quantitative and qualitative research*. Upper Saddle River, NJ: Pearson Education, Inc.

Fogarty, R. (1995). *The mindful school: How to integrate the curricula awareness program*. Palatine, IL: IRI/Skylight Training and Publishing, Inc.

Freiberg, H. J., Driscoll, A., & Stetson, R. H. (1992). *Universal teaching strategies*. Boston, MA: Allyn and Bacon.

Gay, L. R., & Airasian, P. (2003). *Educational research: Competencies for analysis and applications* (7th ed.). Upper Saddle River, NJ: Pearson Education, Inc.

Hamilton County Department of Education. (2005). *HCDE standards and benchmarks*. Retrieved November 27, 2006, from <http://www.hcde.org/standards/stindex.html>

Johnson, A. P. (2005). *A short guide to action research* (2nd ed.). Boston, MA: Pearson Education, Inc.

Leedy, P. D., & Ormrod, J. E. (2005). *Practical research: Planning and design*. Upper Saddle River, NJ: Pearson Education, Inc.

Martin, D. B. (1999). *The portfolio planner*. Upper Saddle River, NJ: Prentice-Hall, Inc.

McAllister, D. A. (2006). *Faculty page – McAllister*. Retrieved November 27, 2006, from <http://oneweb.utc.edu/~deborah-mcallister/>

McMillan, J. H., & Schumacher, S. (2001). *Research in education* (5th ed.). New York, NY: Addison Wesley Longman, Inc.

Menges, R. J., & Weimer, M. (1996). *Teaching on solid ground: Using scholarship to improve practice*. San Francisco, CA: Jossey-Bass Inc.

Mills, G. E. (2003). *Action research: A guide for the teacher researcher* (2nd ed.). Upper Saddle River, NJ: Pearson Education, Inc.

- Mills, S. C., & Roblyer, M. D. (2003). *Technology tools for teachers: A Microsoft Office tutorial*. Upper Saddle River, NJ: Pearson Education, Inc.
- National Council of Teachers of Mathematics. (2000). *Principles and standards for school mathematics*. Retrieved November 27, 2006, from <http://standards.nctm.org/>
- National Research Council. (1999). *How people learn*. Washington, DC: National Academy Press. (see also <http://www.nap.edu/readingroom/books/howpeople1/notice.html>)
- National Research Council. (1995). *National science education standards*. Retrieved November 27, 2006, from <http://www.nap.edu/readingroom/books/nse/>
- Novak, J. D., & Gowin, D. B. (1984). *Learning how to learn*. New York, NY: Cambridge University Press.
- Palloff, R. M., & Pratt, K. (2001). *Lessons from the cyberspace classroom: The realities of online teaching*. San Francisco, CA: Jossey-Bass Inc.
- Provenzo, E. F., Jr. (2002). *The Internet and the World Wide Web for teachers*. Needham Heights, MA: Allyn & Bacon.
- Reed, A. J. S., & Bergemann, V. E. (2001). *A guide to observation, participation, and reflection in the classroom* (4th ed.). New York, NY: McGraw-Hill.
- Roblyer, M. D. (2003). *Integrating educational technology into teaching* (3rd ed.). Upper Saddle River, NJ: Pearson Education, Inc.
- Roblyer, M. D. (2003). *Starting out on the Internet: A learning journey for teachers* (2nd ed.). Upper Saddle River, NJ: Pearson Education, Inc.
- Tennessee Department of Education. (n.d.). *Curriculum standards*. Retrieved November 27, 2006, from <http://www.state.tn.us/education/ci/standards/>
- Thomas, R. M. (2005). *Teachers doing research: An introductory guidebook*. Boston, MA: Pearson Education, Inc.
- Treffinger, D. J., Hohn, R. L., & Feldhusen, J. F. (1979). *Reach each you teach*. Buffalo, NY: D. O. K. Publishers, Inc.
- Tuckman, B. W. (1999). *Conducting educational research* (5th ed.). Fort Worth, TX: Harcourt Brace & Company.
- U.S. Department of Education, Institute of Education Sciences. (n.d.). *Education resources information center*. Retrieved November 27, 2006, from <http://www.eric.ed.gov/>

Items available in Lupton Library

- Campbell, L., Campbell, B., & Dickinson, D. (1996). *Teaching and learning through multiple intelligences*. Needham Heights, MA: Allyn and Bacon.
- Haladyna, T. M. (1997). *Writing test items to evaluate higher order thinking*. Boston, MA: Allyn and Bacon.
- Krulik, S., & Rudnick, J. A. (1995). *The new sourcebook for teaching reasoning and problem solving in elementary schools*. Boston, MA: Allyn and Bacon.
- Ross, S. M., & Morrison, G. R. (1995). *Getting started in instructional technology research*. Washington, DC: Association for Educational Communications and Technology.
- Silberman, M. L. (1996). *Active learning: 101 strategies to teach any subject*. Boston, MA: Allyn and Bacon.

Wilson, B. G. (Ed.). (1996). *Constructivist learning environment: Case studies in instructional design*. Englewood Cliffs, NJ: Educational Technology Publications.

Alternative Grading: A B from You, an A from Me

Julia L. Anderson

Education 590, Spring 2007

The University of Tennessee at Chattanooga

The Institutional Review Board of The University of Tennessee at Chattanooga (FWA00004149) has approved this research project 07-015.

Introduction to the Problem

Grading is subjective; no two teachers are going to give the exact same grade to the same project, and the student and the teacher do not always agree on a grade. For example, students may feel their efforts deserve an A, while the teacher awards the effort a C. The premise of this project is to give the students a voice in grade determination, with a rubric for each letter grade as a guide to help them gauge their efforts.

Review of Literature

Tests are quantitative, and learning is not a completely quantitative process. Learning is a qualitative process, and students learn in different ways and at different speeds. O'Connor (2002, p. 6) discusses the concept of multiple intelligences, "Teachers focus on how smart students are in different ways; the focus is no longer on 'how smart,' but 'how one is smart.'" Multiple intelligences require a variety of instructional and assessment methods; an excellent way to acknowledge individual differences and assess learned concepts is to use student portfolios, which show growth over time. Learning is not a series of unrelated 'slam-dunks;' it is a complicated process that is difficult, if not impossible, to grade accurately.

Esty and Teppo (1992, p. 617) believed that test averaging "penalizes students for what they don't know during the progress of the course instead of rewarding them for what they do know at the end." They graded on progressive improvement and informed their students at the beginning of the course that "only their performance in the final weeks of the class will be counted for assigning grades ... what they learn will be cumulative and that at the end of the course they will be held responsible for *all* the material" (Esty and Teppo, 1992, p. 617). Students liked the professors' approach

because it kept them motivated to keep trying; a lack of knowledge at the beginning did not hurt them after they worked throughout the semester to master the material.

The literature reflects widely differing views on grading, but most of it states that the current system is wrong and scars students for life, and offers various ways to remedy the ongoing problems:

To ignore the complexity of the grading issue is to live in a fantasy world where houses are made of gingerbread, the stork delivers babies, and failure has no effect on a person's life. (Simon & Bellanca, 1976, p. 1)

Grades have made us into overseers driving the most reluctant group of field hands ever known. Grades have made us puppeteers pulling the emotional strings of live marionettes. Grades have made our students believe that 'wadjaget' is the most important word to be used when summarizing their own education. (Simon and Bellanca, 1976, p. 124)

An 'A' in 'English' means only that some adult thought the student's work was excellent. Compared to what or whom? As determined by what criteria? In reference to what specific subject matter? (Wiggins, 1990, p. 2)

To go farther back on the interpretative grading issue,

In 1912 ... a study was conducted by Starch and Elliot which dramatically

questioned the reliability of grades as a measurement of pupil accomplishment.

The aim of the study was to determine how much the personal values and expectations of individual teachers influence their grading standards. ...

Copies of two English language examination papers written by two pupils ...were...sent to two hundred high schools. One hundred forty-two schools returned their graded papers. ... For one paper, scores varied from 64 to 98 points, with an average of 88.2. The other paper had a range from 50 to 97, with an average score of 80.2. (Kirschenbaum, Simon & Napier, 1971, p. 54-55).

This issue is still raging today, almost a century later, and a similar experiment (Simon & Bellanca, 1976) generated similar results. The same paper receives different grades from different teachers because teachers apply personal values, such as neatness, to their grading, even when instructed not to do so. The only questions immune to instructors' personal interpretations are the ever-popular multiple-choice and True-False. Simon and Bellanca illustrate the teachers' interpretative grading dilemma throughout their book.

The literature does not give one correct way to motivate students to earn higher grades, and some alternative grading studies report greater success than others. In the literature, grades do not necessarily motivate students, so educators must accept that, for various reasons, not every student wants to, or, for reasons outside his or her control, can do well.

A concept tied closely to alternative grading, authentic assessment is “designed to increase the retention of information through the use of alternative methods of

instruction” (Engel, Pulley, & Rybinski, 2003, p. ii). With the increased emphasis on standardized test scores, “the focus for teachers seems to be centered on test items rather than general content knowledge” (Engel, et al., p. ii). Parents, used to traditional instruction, with regular tests and letter grades, are skeptical of authentic assessment, which stresses the application of skills to meet society’s expectations of critical thinking, analysis, and problem-solving. The goal of authentic assessment is to teach students these crucial life skills... “what they know, can do, and are like” (O’Connor, 2002, p. 12).

One of the major challenges facing educators today is motivating students to learn. When using authentic assessment, the educator is doing just that, involving the students in their own learning process; giving them a chance to see where they are and where they need to be. ... The main goal of the assessment is to help students set goals, monitor their own work, and evaluate their own efforts (Engel, et al., 2003, p. 24).

It is interesting that the concept of authentic assessment is now being debated, because, historically, authentic assessment was the norm.

In the Middle Ages and the Renaissance ... if a boy wanted to learn a trade and join a guild, he studied with a Master until he was deemed ready to join the guild. If he wanted to enter the medieval universities ... he’d have to be examined ... what he had to do to pass was clear” (Kirschenbaum, et al., 1971, p. 48).

Then the tutors (teachers) were held accountable for their students' knowledge and expertise; the teachers' future livelihood depended on their former students' success, since wealthy families preferred to hire tutors highly recommended by former students.

Another concept, the "virtual classroom," incorporates the alternative grading and authentic assessment concepts of student input and preparation for real-life (in this case, school administration). "Reform is asking classroom teachers to encourage active learning and to share responsibility and decision-making with the students" (Williams, 1995, p. 1). Students will learn, retain, and be able to apply their new-found knowledge, if they are more involved in the academic process. "Direct instruction as the main focus does not prepare students to be responsible, thoughtful administrators with action plans, nor does it provide practice in problem-solving" (Williams, 1995, p. 5). This author feels that the days of passively listening to (or dozing through) a professor's lectures are over, and she shares the authentic task philosophy of Grant Wiggins, which encourages teachers to assign and assess students on tasks they will use in real-life situations to prepare them for successful careers.

The literature shows a movement at all levels of the educational spectrum, from grammar school through graduate school, of involving students in the educational grading process to increase understanding and retention, with the short-term goal, in some instances, of raising the standardized test scores on which many schools' funding depends.

And, as if the teachers are not under enough pressure, if teachers do not grade the improvements they are implementing, the students do not attach any importance to the teachers' efforts! Wilson's study determined that, although math students were frequently

given self-evaluation writing assignments, when asked if they were given writing assignments, the students said no because the writing assignments were not graded. To put this in mathematical terms, zero grade equals zero importance in the students' minds. In this article, the students' lack of involvement in the authentic assessment project literally negated its impact on them. The teacher, Ms. League, knew her students' strengths and weaknesses, did an excellent job of teaching, and worked hard under harsh conditions with no classroom of her own, but her Herculean efforts were lost on the students. The other teacher in the study, who used traditional methods, in reality, performed better than Ms. League, because,

The one critical, but absent, component [in Ms. League's efforts] was an attempt to incorporate any of these efforts into the grading system. From the students' point of view, what counted as knowledge and what warranted their efforts were only those activities that resulted in a number in the grade book. ... What mattered to them was [*sic*] the procedural, textbook questions that appeared on tests and quizzes. (Wilson, 1993, p. 14)

Students must be involved in teaching efforts; it is no longer a give-and-take relationship in that the teacher gives knowledge, the students absorb it, and tests document this. The current movement is "letting students know what is expected of them, giving feedback before grades, and encouraging intellectual risk-taking" (Raebeck, 1993, p. 1). Making a student a stakeholder, as well as an active participant, in his or her education is a significant change from the traditional passive role played by students in

American education; it reflects the Middle Ages mastery approach. Many proponents who have implemented student-choice grading systems believe that the students' involvement in determining their grades increased motivation and the desire to do better.

Buzz R. Pounds, in his freshman writing course, had his students write contracts to, in effect, determine their own assignments and grade themselves. "Giving students ownership over assessment as active stakeholders was important since education research indicates that student learning increases when motivation is increased" (Pounds, 1999, p. 5). His experiment was, on the whole, a success, but he fought the same battle as Linda Dager Wilson's beleaguered Ms. League; for example, students wanted anything they turned in to count toward their final grade. In his study, a student wanted "her contract to count as a paper because why do the work for no grade?" (Pounds, 1999, p. 7) And, while most students gave themselves As, two or three downgraded themselves to Bs, which he accepted. When his students asked, "So are you really going to give us all As? [he answered] I'm not giving you anything" (Pounds, 1999, p. 6).

Edward Proffitt, a professor who taught freshman English at Manhattan College, used an innovative alternative grading system. He assigned a certain number of assignments to earn a C, added additional assignments for a B, and added a research paper for students who wanted to earn an A. Proffitt wrote:

"No more than twenty per cent of any given class has done the minimum (ten per cent has been the norm), and some of those students would probably not have done even that in a typical freshman English class...I have not yet had a student who disliked the system, and a great many have stated that it helped to increase their interest in a course that they did not wish to take at the outset.

(Proffitt, 1977, p. 2)

Sam Allgood's (2001, p. 491) analysis of college economics students found the following:

The mean effect of a teaching innovation on student learning is likely to be small...the benefits are concentrated among those at the lower end of the grade scale and the remaining students had no response to the innovation.

Allgood hoped that if he showed students faster ways to learn, they would spend more time studying economics, improving both their grade and their mastery of economics, but they spent more time on other pursuits instead. Students often wondered why they had to learn certain things, because the students did not think they would use this knowledge outside of the economics course. Allgood echoed the Middle Ages philosophy (Wiggins, 1990. Newmann, Brandt, & Wiggins, 1998; & Williams, 1995 by concluding the following:

It is possible that reconsidering how we assess students may help to motivate students to learn. It is not necessarily an issue of changing what is taught or how it is taught. If students understand the value of the knowledge they are acquiring, then they are likely to view their education as more than just a means to an end, and that may be the most important step towards motivating students to learn more. (Allgood, p. 492)

Newmann, Brandt, and Wiggins (1998, p. 19) concur, stating, "In a national study of 24 schools, we found that students of elementary, middle, and high school teachers in

mathematics and social studies who assigned authentic assessment tasks achieved at much higher levels ... than students whose teachers assigned less authentic assessment tasks.”

In conclusion, alternative grading may not be a panacea, but it is an earnest effort to grade fairly and to measure what the students are actually absorbing by giving the students a structured method to communicate their learning process with the teacher. As with every other issue, the alternative grading concept continues to expand, educators have found various methods successful, and the literature provides many different perspectives and facets of this ongoing debate. However, standardized tests are here to stay, at least for the foreseeable future.

Standardized testing has its place in the American education system. If a teacher is looking for ranking, or a comparison among students in a particular age group, then standardized tests can help. However, if the teacher is looking for day-to-day information to make crucial instructional decisions, then alternative means of assessment can be used. (Engel, et al., 1995, p. 19)

After all, students are not standards; they are individuals, with individual learning patterns. One teaching, assessment, or grading method does not, and probably never will, fit all. As with any other complex issue, even the experts cannot agree, and the same issues will continue to be debated for decades to come.

Data Collection and Results

Data Collection

Before the study was conducted, both consenting parents and students completed a brief survey stating their views about the fairness of the grading system. Then, each week for 3 weeks, participating students completed a brief questionnaire asking if they understood the material covered the preceding week, if they had any questions or comments, and to give themselves the grade they thought their previous week's efforts deserved, based on the rubric on the flip side of the questionnaire. At the end of the 3 weeks, students completed the same survey to see if their feelings had changed. Instruments are contained in Appendices A-F.

Methodology

I used the weekly questionnaires to check student comprehension and incorporated their feedback into future lessons. Their self-assessment, using the rubric as a guide, made a few of the students think about what their efforts deserved; that was one of the project's goals.

Time Commitments

Each student probably spent 30 minutes or less on the entire project because of the constraints imposed by the cooperating teacher in my student teaching placement.

Results

Of the 11 returned Pre-Study Parental Questionnaires, 5 parents agreed the current grading system is fair, while 6 were undecided. Two parents agreed that the current grading system accurately reflected what their child learned, while four were undecided and five disagreed. One parent strongly agreed that "I would like for my child to help determine his/her grades by writing regular self-assessments and participating in student-teacher conferences," while eight agreed and two were undecided. Five parents agreed

that “a de-emphasis on grades would help their child focus on learning,” while six were undecided.

Of the 12 returned Student Pre-Study Questionnaires, 7 students agreed that the current grading system was fair, 4 were undecided, and 1 disagreed. One student strongly agreed that the current grading system accurately reflected what he or she learned, seven agreed, two were undecided, and two disagreed. Five students checked agree by “to help determine [their] grades by writing regular self-assessments and participating in student-teacher conferences,” while seven were undecided. Three students felt that “a de-emphasis on grades would help [them] focus on learning,” while eight were undecided, and 1 disagreed. See Figure 1.

Pre-Study Questionnaire Parent and Student Responses

1. I think the current grading system is fair.

Agree – 5 parents, 7 students

Undecided – 6 parents, 4 students

Disagree – 1 student

2. I think the current grading system accurately reflects what I/my child has learned.

Strongly Agree – 1 student

Agree – 2 parents, 7 students

Undecided – 4 parents, 2 students

Disagree – 5 parents, 2 students

3. I would like to help determine my grades by writing regular self-assessments and participating in student-teacher conferences.

Strongly Agree – 1 parent

Agree -- 8 parents, 5 students

Undecided – 2 parents, 7 students

4. I feel that a de-emphasis on grades would help focus on learning.

Agree -- 5 parents, 3 students

Undecided -- 6 parents, 8 students

Disagree – 1 student

Figure 1. Pre-study questionnaire summary.

Of the five students who completed both the Pre-Study and the Post-Study Questionnaires, the students' confidence in the fairness of the current grading system dropped from the Pre-Study to the Post-Study questionnaire. The results were still varied, but the study moved most students out of the undecided ranks, for better or for worse. The same student who did not want to help determine her grades on the Pre-Study Questionnaire strongly disagreed on the Post-Study Questionnaire, as well. This is the top student in the class, a brilliant, straight-A student. See Figure 2.

Pre- and Post-Study Student Responses		
	Pre-Study	Post-Study
1. I think the current grading system is fair.		
Agree	3	1
Undecided	2	4
2. I think the current grading system accurately reflects what I have learned.		
Agree	2	2
Undecided	0	2
Disagree	3	1
3. I would like to help determine my grades by writing regular self-assessments and participating in student-teacher conferences.		
Strongly Agree	0	1
Agree	0	2
Undecided	4	0
Disagree	0	1
Strongly Disagree	1	1
4. I feel that a de-emphasis on grades would help me focus on learning.		
Strongly Agree	0	1
Agree	1	1

Undecided	2	1
Disagree	2	2

Figure 2. Comparison of student pre-study and post-study questionnaire

responses.

On the weekly self-assessment sheets, I asked each student to write which grade he or she deserved that week, based on the rubric. The three strong A students always thought they deserved an A, which they did. No other student thought he or she deserved a lower grade than he or she was getting; in fact, it went the other way if there was a discrepancy. My hypothesis was not proved because the students either were getting the grade they thought they deserved, or they awarded themselves a higher grade than they were actually getting. The students' self-assessment results for their actual grade and the grade they thought their effort deserved are presented in Figure 3.

Week 1 Actual & Choice		Week 2 Actual & Choice		Week 3 Actual & Choice	
B	B	F	?	--	--
A	A	A	A	A	A
D	C	F	C	F	C
F	B	B+	B+	B	B
B	--	C	C or B	D	--
A	A	A	A	A	A
A	A	A	A	A	A
B	A	B	A	B	B
C	A	D	--	F	--
C	A	C	--	F	--

F	D
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
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95	95
96	96
97	97
98	98
99	99
100	100

C --

A --

Figure 3. Actual and self-assessed grades.

Conclusions and Recommendations

Conclusions

Even though this project was not nearly what it was envisioned to be, the results were still helpful. The fact that the sample is so small, plus the study was conducted under challenging conditions, at least partially explains the varied results. The student who strongly agreed in the post-study questionnaire about helping to determine her grades was the student who best expressed her preferences on the weekly survey sheets so the student teacher could adjust the instruction. The entire project was conducted over the student teacher's 3 weeks of teaching, so both students and teacher were getting used to each other's styles, and some of the students' grades dropped during this period.

The student feedback to the weekly self-assessment questions was helpful, and I would use a weekly self-assessment in my own classroom because it encourages the students to take responsibility for their academic standing, to identify any learning gaps, and to give the teacher feedback about what they like and don't like. I would stress to the students that they need to be honest about their responses, because every student said he or she participated in class, and most of them did not. Also, the students need to be honest about their actual effort versus the grade they deserve.

I could not make any generalizations about this survey because the results were so varied and the sample was so small.

Recommendations

If I conducted this survey again, I would modify the proposed weekly self-assessment sheet to reflect what the students were covering that week (which I actually did each week during the project). I would also add the sentence, “Based on the rubric, what grade do you think your efforts this week deserve?” I modified the attached rubric to reflect the changes actually made during this project – the students did not understand the wording on the original rubric. “Content mastery” and “skill mastery” drew blank looks from seventh graders!

Grant money could be found to support further research in this area, because it is compatible with the current No Child Left Behind mandate. Ideally, the students themselves will tell you when they are being left behind and in what areas, so the material in question can be addressed in a timely manner. Technology could play an important role in addressing the material in the form of tutorials and online research – some students would enjoy researching an area confusing to them and learning interesting facts to help them understand the material, and, possibly, relate it to their lives.

I would recommend that teachers use the weekly self-assessment format to encourage regular written, candid feedback from the students. Some of the student feedback was helpful and enabled me to present information students did not understand the first time. The student who best expressed herself on the weekly self-assessments was the student who strongly agreed about helping determine her grade in the Post-Study. This weekly format can be a powerful tool when used correctly by both student and teacher.

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Appendix A

Based on my research, I expected the students to give themselves lower grades than they were actually earning, and I expected the survey results to be more favorable in regard to being involved in determining their own grades via self-assessment and weekly student-teacher conferences. I also expected most students' grades to rise while I was student teaching, instead of dropping, as the cooperating teacher said they did. Also, the grades for the current 3-week period show a decline for about half of the students during the last 2 weeks. Much of this is due to the fact that the students did not turn in their assignments.

Appendix B

Pre-Study Student Questionnaire

Research Questions

Please respond to the following items by drawing a circle around the response that most closely reflects your opinion.

1. I think the current grading system is fair.

5 Strongly Agree 4 Agree 3 Undecided 2 Disagree 1 Strongly Disagree

2. I think the current grading system accurately reflects what I've learned.

5 Strongly Agree 4 Agree 3 Undecided 2 Disagree 1 Strongly Disagree

3. I would like to help determine my grades by writing regular self-assessments and participating in student-teacher conferences.

5 Strongly Agree 4 Agree 3 Undecided 2 Disagree 1 Strongly Disagree

4. I feel that a de-emphasis on grades would help me focus on learning.

5 Strongly Agree 4 Agree 3 Undecided 2 Disagree 1 Strongly Disagree

5. If you have any additional comments, please write them here.

Please respond by (date), and thank you for participating in this survey.

Appendix C

Post-Study Student Questionnaire

Research Questions

Please respond to the following items by drawing a circle around the response that most closely reflects your opinion.

1. I think the alternative grading system is fair.

5 Strongly Agree 4 Agree 3 Undecided 2 Disagree 1 Strongly Disagree

2. I think the alternative grading system accurately reflects what I've learned.

5 Strongly Agree 4 Agree 3 Undecided 2 Disagree 1 Strongly Disagree

3. I enjoyed determining my grades by writing regular self-assessments and participating in student-teacher conferences.

5 Strongly Agree 4 Agree 3 Undecided 2 Disagree 1 Strongly Disagree

4. I felt that a de-emphasis on grades helped me focus on learning.

5 Strongly Agree 4 Agree 3 Undecided 2 Disagree 1 Strongly Disagree

5. If you have any additional comments, please write them here.

Please respond by (date), and thank you for participating in this survey.

Appendix D

Pre-Study Parent Questionnaire

Research Questions

Please respond to the following items by drawing a circle around the response that most closely reflects your opinion.

1. I think the current grading system is fair.

5 Strongly Agree 4 Agree 3 Undecided 2 Disagree 1 Strongly Disagree

2. I think the current grading system accurately reflects what my child has learned.

5 Strongly Agree 4 Agree 3 Undecided 2 Disagree 1 Strongly Disagree

3. I would like for my child to help determine his/her grades by writing regular self-assessments and participating in student-teacher conferences.

5 Strongly Agree 4 Agree 3 Undecided 2 Disagree 1 Strongly Disagree

4. I feel that a de-emphasis on grades would help my child focus on learning.

5 Strongly Agree 4 Agree 3 Undecided 2 Disagree 1 Strongly Disagree

5. If you have any additional comments, please write them here.

Appendix E

Rubric

Criteria for an A

Participates actively in class
Shows a great deal of effort
Does all homework
Does well on tests
Is on time for class
Shows respect and works well with others
Is always prepared

Criteria for a B

Shows good participation
Misses no more than one to two assignments
Has one to two tardies
Shows good knowledge of material
Has no unauthorized absences
Shows some effort
Demonstrates respect for others

Criteria for a C

Demonstrates some knowledge of material and passes all tests
Work is frequently late or not turned in
Rarely participates in class
Shows little effort
Has several tardies
Has unauthorized absences
Is frequently not prepared

Criteria for a D

Doesn't show knowledge of material and performs poorly on tests
Has large number of assignments not turned in
Shows no effort or participation
Shows little respect for others
Has several unauthorized absences
Is disruptive in class
Is often tardy

(Mills, 2002)

Appendix F

Student's Weekly Self-Assessment Form

1) Content Mastery (Assigned Reading)

Do you understand the story we studied this week?

2. Skill Mastery (Grammar) Do you understand the grammar we studied this week?

3. Completion of Work Did you complete your assignments this week?

4. In-Class Activity (Participation) Did you participate in class this week?

5. Concerns (Any Learning Gaps? Any Questions?)

6. Do you have any additional comments about your learning experience in this week's classes? (Continue on back of page, if necessary.)

Based on the rubric, what grade do you think your efforts this week deserve? _____

Expanding Technology Use for the 21st Century Classroom

Natasha Brunton

Education 590, Spring 2007

The University of Tennessee at Chattanooga

*The Institutional Review Board of The University of Tennessee at Chattanooga
(FWA00004149) has approved this research project 07-006*

Introduction to the Problem

The purpose of this study was to investigate the use of computers within all freshman classes at a private high school in Chattanooga, TN, and to determine whether further technology integration was necessary. I wanted to know the opinions of students and teachers regarding the current use of technology in the classroom and compare these results to student achievement.

Freshman students take two English courses. The first of these courses resembles the traditional literature course. Students study various modes of writing, investigate literary themes, perform research, and write creative essays. The second course, the course that I have been teaching for the past 2 years, incorporates the daily use of computers in studies of composition, research, creative writing, and grammar. Included in these studies are various computer applications that include the interpretation of data using Excel, the creation of presentations in PowerPoint, narrative essays performed using podcasts, and persuasive writing that extends to the creation of student commercials and Web sites. This course eliminates the use of a traditional textbook, and uses Web resources as the primary information basis. In doing so, students must evaluate the validity of presented information, and properly cite all outside resources.

Research has shown that similar classroom designs reinforce higher level thinking skills such as problem-solving, analysis, synthesis, and evaluation. However, this is the only course at the school that strictly adheres to the technology classroom model. I intend to study whether the inclusion of this freshman course is both enjoyable to the student and educationally relevant. I additionally want to know whether other teachers are reinforcing the use of computers within their own curriculum, or whether they view these

practices as relevant and/or possible given their current technological knowledge and resources.

Review of Literature

On the first day of school, I present a PowerPoint presentation and begin a discussion with my students about the advances in technology that have taken place since my birth in 1974. This usually begins in quite a light-hearted manner as the children giggle at 5-pound cell phones, boxy computers, dot-matrix printers, tape recorders, and comparatively small television sets with a limited batch of channels. These are students who were born after the advent of the Internet, who have never lived without a personal computer, and who received their first personal cell phone in middle school, at the latest. Rather than exchanging phone numbers, they invite one another as friends on MySpace. They scan YouTube for the latest community videos, and post their own video creations for the world to see. They stretch their own creativity, and are inspired by the creations of others. I have one student who has produced several stop-animation movies in his basement; he invests over 40 hours of work to create 2-minute snippets that show a true understanding of irony, wit, and a distinct perspective of the world around him. For these students, technology has created a world of entertainment, an unbridled atmosphere that is primarily limited to extracurricular pursuits. Can these students' interest in technology-based information be better adapted to the classroom environment? Shouldn't these students also be learning the ethical responsibilities regarding the use of computers, and technology's value beyond entertainment, into the realms of viable information, scholarly applications, and relevance in the worlds of business, science, politics, and all fields of exploration?

A recent Time magazine article, “How to Build a Student for the 21st Century,” exposes the problem of today’s outmoded classroom (Wallis & Steptoe, 2006). The authors profess, “American schools aren’t exactly frozen in time, but considering the pace of change in other areas of life, our public schools tend to feel like throwbacks” (Wallis & Steptoe, 2006 p. 52). The majority of classes are still set with desks in neat rows, a teacher placed neatly in the front of the room, and supply lists that still request pencils, pens, paper, and notebooks. Book covers are placed over hard-backed books that add an oppressive weight when lugged over the shoulder in a standard backpack. There are many changes suggested by the authors to modernize the classroom setting, and many of these include a better implementation of technology. Most importantly, students need to be able to synthesize the information around them. As stated in the article, “In an age of overflowing information and proliferating media, kids need to rapidly process what’s coming at them and distinguish between what’s reliable and what isn’t” (Wallis & Steptoe, 2006 p. 53). Students are adept at locating informational sources, but can they distinguish good from bad?

Colleges and universities desire students who have cultivated higher-reasoning skills beyond summarization or outright plagiarism (expanded upon in later paragraphs); they desire students who are able to assimilate multiple informational resources. In fact, these qualities are desirable in all graduates, not simply the college-bound. Golden (2006) explains, when discussing educational changes in Pennsylvania:

Under the leadership of Gov. Edward G. Rendell, we are moving swiftly in Pennsylvania to prepare our students for higher education, and to ensure they’ll enter the workforce with the skills and knowledge to succeed in a newly

competitive world. We have built a foundation to establish student-centered, data-informed, and differentiated teaching and learning across the Commonwealth. (p. 25)

His plan recognizes the need for change for all students, regardless of their academic track. Furthermore, a pivotal assertion in the above statement resides in the mention of the global community. American students no longer simply compete with one another in business and academic realms, but are now, more than ever, contending directly with a global society. Technology offers an accessible window for all students into this global world. Yes, students need the technological skills and know-how to be on equal footing with their global peers, but they also need to reach one another through these venues. With the use of technology, students can communicate through digital video or direct email, take virtual tours of communities to which they may never have physical access, and share their own thoughts and creativity with a worldwide audience. Rather than making assumptions about the world around them, and cultures outside of their own, they have the opportunity to interact directly with these populations. They may even enact and instigate change. One such example of this comes from a teacher at St. Andrew's Sewanee School, in Sewanee, TN (M. Brunton, personal communication, 2006). He encourages students in his Political Action class to take a stance on a social issue about which they feel strongly. These projects have led to Web sites that discuss the ills of urban sprawl, and blog communities that allow a forum for further discussion of critical issues. Such a project brings a new relevancy to the curriculum, and empowers students to recognize their ability to affect the world around them.

Not only should technology be expanded in our schools, but many national and local programs are insisting that such changes take place. Studies on the subject regarding the relevancy of technology in the classroom have overwhelmingly demonstrated positive results when thoughtful, well-funded, and clearly-defined strategies in this area are properly applied (Clark 2006). This being said, why don't more schools clearly execute the consistent use of technology? The answer to this question proves that there are financial, logistical, and emotional obstacles that must be overcome. In Clark's (2006) survey of both teachers and administrators, regarding such barriers, discloses several reoccurring themes, ranging from the lack of proper teacher training in new technologies, limited access to necessary hardware and/or software programs, and inadequate technical support, to the ever-changing growth of new-technologies. With regard to this last problem, he ascertains, "The speed at which technology is changing and advancing provides an additional challenge to educators as they struggle with the issue of educational technology" (Clark, 2006 p. 481). Knowing where to focus the funding that does exist poses a problem for administrators as technologies consistently transform. This proves a difficult barrier to surmount, but other hindrances may be easier to address initially. Most notable of these solvable concerns is the implementation of adequate professional development. Perhaps the solution to this problem can aid in the resolution of the first. Once educators, themselves, know what technologies are available, and how to properly use them, they may be more adept at recommending the best options for their school environment.

Unfortunately, many veteran teachers resist any change in their teaching practices, and there tends to be an apprehension among many educators because their own

technological know-how is easily trumped by that of their students. In short, many educators are simply not adequately trained, prepared, or comfortable with the use of existing technologies. Mulqueen (2001) states, in his study of teachers who consistently struggled with their own technological inadequacies, “(T)eachers were afraid that they would lose respect, status, and power with their students” (p. 251). Fear proved to be an essential barrier, but such a problem won’t simply dissipate on its own. Without adequate professional development, this gap will only continue to grow. Kara-Soteriou (2006), in her aptly titled article, “How do you get started when your middle and high school students know more technology than you?,” recounts,

In a 2002 report from the Office of Social & Economic Data Analysis it was revealed that at least 50% of veteran and new teachers believed they were educational technology novices, and only 42% of new teachers stated that they felt well prepared to use computers in their instruction. (p.64)

The most surprising aspect of this research stems from the fact that even new teachers were not adequately prepared. She professes a gradual integration of computers into the classroom by beginning with simple to more complex Internet use, and starting with training in the most widely used software programs. More importantly, although she insists that training is pivotal, she emphasizes that it is ok if the students know more about the technology than the educator. In fact, this may prove to be an opportunity for more technologically-proficient students to accept leadership roles: “(T)eachers could allow their more technologically knowledgeable students to teach those who are less knowledgeable” (Kara-Soteriou, 2006, p. 66). Not only could students learn from one another, but the teacher could learn from students, in the process.

Beyond these logistical boundaries, there exist theoretical oppositions to the use of technology in schools. Many teachers feel that students are already too dependent on the Internet for research information, and that students should be more familiar with traditional research methods. Arguably, almost all research can now be done online, as text databases have scanned and logged millions of previously text-only sources. Of additional grave concern resides the topic of plagiarism. With the proliferation of Internet sources, students often cut and paste large segments of information without proper citation, or even download the completed work of another. The truth of the matter is that encouraging students to use book sources over those found on the Internet will not solve these problems. Such questionable actions actually require the open discussion of the ethical use of existing media. Johnson (1998), a leading researcher in the area of computer ethics, professes,

When students start using technology, especially information technologies that consist of computers and computer networks, they start operating in a new world: a virtual world. Suddenly behaviors may not be as easily judged to be right or wrong. (p. 2)

Johnson is a proponent of computer ethics training, stating that students don't innately understand the boundaries of acceptable behavior in an abstract context—the virtual context of the World Wide Web. Acceptable and nonacceptable use must be clearly outlined by educators, and students must be taught how to use these resources without exploiting such readily available information.

Technological advances that influence our colleges, universities, businesses, and daily lives, should not be ignored in the K-12 classroom. Despite a student's

technological savvy for the purpose of entertainment, they may not be prepared to transfer this knowledge to their intellectual pursuits without the guidance of educators. Because of this, educators themselves must be prepared to deal with the technological advances that surround them, and implement such practices in the classroom environment. The encroachment of technology may complicate the educational environment, but it equally offers new opportunities to involve students in the ever-expanding global community. There are boundaries facing both teachers and administrators in their mission to include technology within the general curriculum, but these boundaries may be overcome with the proper training, funding, and design of technology programs within our schools.

Data Collection and Results

Data Collection

Methodology

Teacher survey. Copies of this survey can be viewed in Appendix A. Survey results can be viewed in Appendix C.

Student Survey. Copies of this survey can be viewed in Appendix B. Survey results can be viewed in Appendix C.

Recruitment and Selection

I intend to survey a total of 75 freshman students, as well as all freshman teachers (15), regardless of their teaching subject. Of the students, half will be enrolled in honors curriculum while the other half will be enrolled in strictly standard college preparation courses. This survey will evaluate a participant's technological skills, their opinions on the general use of technology, and their personal use of computers inside and outside of

the classroom. Teacher survey results will be directly cross-referenced with the results of their students to check for varying opinions on the use of technology in the classroom, and the technological proficiency of both students and teachers. Additionally, variations in student results between honors and nonhonors students will be investigated.

Once the initial survey results have been analyzed, a more quantitative approach will be applied. Student grades in all classes will be compared to determine whether there are variables in achievement that correlate with the use or non-use of technology in the classroom. Patterns of achievement will be examined for disparity among honors and nonhonors students, students with more prior experience with technology in the classroom, and student extracurricular computer habits.

Instructional Plan and Leadership

Timeline commitments. Students will be given surveys at the beginning of a chosen class period, and teachers will have up to 2 weeks to submit their response. The largest investment of time will be in the interpretation of survey results, which could take up to a month to adequately chart and analyze.

Results

A total of 22 student and 7 teacher responses were included in the final results. There were five main areas where attention was focused when investigating these survey outcomes. The first four of these areas were teacher and student computer proficiency, both student and teacher opinions on the use of computers in the classroom, the perceived usefulness of including computers in the current curriculum, and possible hindrances to increasing this use. The final focus compared the teacher's proficiency and incorporation

of current technologies within their lessons to the current grades of their students within their classes.

According to the survey results, students rate their proficiency at a lower skill level than their teacher counterparts; however, students are familiar with more computer programs and use the computer on a more regular basis. Students and teachers rated themselves as either experts, above average, average, or below average in their computer proficiency. The student results show that 9% consider themselves to be experts, 32% consider themselves to be above average, 55% believe that their skills are average, and 5% rated themselves as below average. In comparison, teacher responses reveal that none consider themselves to be experts, 57% consider themselves to be above average, 29% believe that their skills are average, and 14% rated themselves as below average. Student results varied over a larger spectrum of the given possibilities, but these responses show that only 41% of students rated themselves as expert or above average, whereas 57% of teachers rated themselves as above average.

In contrast to these self-imposed labels, students revealed a larger degree of actual computer usage. Of the basic Microsoft Office programs, the recorded results show that all students and teachers have used Microsoft Word, 100% of students and 86% of teachers have used Microsoft Excel, 100% of students and 71% of teachers have used Microsoft PowerPoint, 82% of students and 0% of teachers have used Microsoft Publisher, and 14% of students (compared to 0% of teachers) have used Microsoft FrontPage. Of the broader list of programs, teachers only responded to using Adobe Photoshop (14%) and other Web creation software (14%). Students again show a much more diverse portfolio of experience: Microsoft MovieMaker (32%), Podcasting software

(36%), Apple GarageBand (9%), Adobe Photoshop (68%), Adobe Illustrator (18%), and other Web creation software (27%). Most of this student usage was done either outside of the classroom or in the computer-based English course that I teach. Outside of this one course, most of the computer applications that students participated in were purely for entertainment purposes: gaming, shopping, watching videos, downloading music, emailing, and visiting sites such as MySpace or Facebook. Granted, the surveyed population of students was larger than that of faculty, but every student respondent had a larger repertoire of experience than any of the teacher respondents. The charts below (Figures 1 and 2) offer a visual representation of these results.

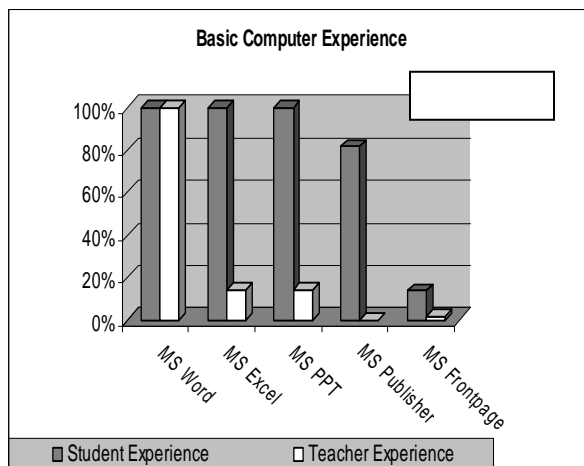


Figure 1. Basic computer experience.

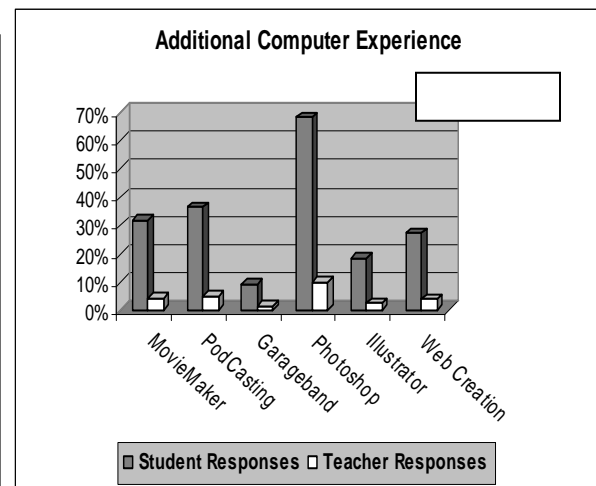


Figure 2. Additional computer experience.

Student and teacher responses correlate more closely when it comes to their opinions regarding the use of computers within the classroom environment. Seventy-one percent of teachers and 73% of students agreed that computers are effective in improving student learning, 43% of teachers and 55% of students stated that technology should be incorporated in more assignments, and no one suggested that computers should be used less often in the classroom. However, teachers admitted that they only require their students to use computer applications for typing papers and Internet research. On the contrary, all students reported that their favorite assignments incorporated various technologies. Most students preferred assignments that used PowerPoint, Excel, or Audacity (a program used for podcasting). Many of these lessons were done as an assignment option (rather than through the required use of technology), or were completed in the student's integrated technology English course.

Teachers agreed that there are many obstacles to increasing the use of technology, including inadequate access to computers throughout the school day, the need for additional training, difficulty in designing adequate lessons that incorporate technology, and an overall comfort level with existing lesson plans. Of these, the strongest reasons, according to the teacher respondents, are inadequate access (29%) and preference to existing lessons (43%).

As for grades, there was not a significant difference between grade distribution and the use of computers for school projects. Unfortunately, this was difficult to gauge because only one of the teachers even requires the use of computer applications (outside of paper writing) for any of their classroom assignments.

Conclusions and Recommendations

Conclusions

At this point, our students have a better understanding of various computer applications than do our teachers. Because of this, students are using this technology more for personal entertainment than for its academic possibilities. Teachers complain that student email messages are riddled with spelling and grammatical errors (or lack grammatical structure entirely), but isn't this influenced by the fact that they are not taught the professional applications of such media?

In order to better prepare our students to use technology for more professional applications, there needs to be better integration of available technologies within the classroom. To accomplish this, there must be better access to this technology on the school campus, better training on various applications for teachers, and an easier means for teachers to investigate lesson possibilities.

Recommendations

The school currently has two computer labs (22 computers in each room), the library/media center (30 computers), a portable laptop station (25 laptops), and one computer in each classroom (primarily for the teacher's use). A few classrooms have more than one computer, but no classroom (other than the labs) has enough machines for the entire class of students. Of these available computers, there are only two open class periods throughout the week where the lab may be reserved, and the media center and the portable station are available throughout the week for reserved sessions. Unfortunately, with over 30 classes running at any one given time, these reserved spaces fill quite quickly.

As a start, at least one more portable laptop station would be beneficial. This would increase the available reserve spaces by 50%. This would require an investment of \$10,000 that may be gained through increased tuition, or preferably through grant-writing. There are several grants created specifically for improved technology; these grants include those sponsored by The Bill and Melinda Gates Foundation, as well as state and federal funding.

Another possible resolution is to require students to purchase laptops, or include the cost of personal laptops within the tuition cost. The drawback to this option is the maintenance of these computers, and the risk of property loss or damage. However, several private high schools and colleges require their students to invest in computer leasing plans. Students are only asked to pay a portion of the computer cost to use the computer throughout the year, and are given the opportunity to purchase the computer at the end of the leasing period. In such instances, the leasing company is responsible for

computer repairs and updates. Due to the financial security of most of our student population, this is a viable option. In-school grants could be provided for families who may find the cost prohibitive. More research is needed to find an appropriate leaser, and a viable plan for the school and student needs. However, this option is worth further investigation.

Of course, more equipment without more training will not solve the problem. Teachers who are reluctant to change their current lessons, uncomfortable with various technologies, or too pressed for time to research technology alternatives, need assistance in these endeavors. Since the level of proficiency varies from teacher to teacher, training on specific programs should be completely voluntary. There are several in-service days throughout the year that are not reserved for specific learning activities, and I would be happy to offer brief courses, during these open sessions, for learning specific programs: PowerPoint, FrontPage, Excel, Publisher, Illustrator, PhotoShop, Blogger (Google's blog program), and any other requested programs. There are other teachers within the school who have experiences with these applications, as well, and they may be willing to contribute their time to these scheduled training sessions. All of the Microsoft programs are currently available on the school computers, but are used limitedly by the faculty. I am working on getting the Adobe (Illustrator and Photoshop) programs added to the system in one of the current labs.

I have also instated a new teacher blogging Web site that is currently being used as an online newsletter and message-posting area for teachers. Instructors are encouraged to post their current lesson plans, lesson ideas, links to assistance, available training (outside of the school), and messages regarding their positive teaching experiences. This

venue has allowed me, and others, to share their technology-based lesson plans (along with the accompanying handouts and guidelines) so that effective lessons may be repeated in multiple environments. This provides teachers who are pressed for time with the opportunity to try a new lesson without an oppressive investment of time. I will continue in my own course, taught throughout a student's freshmen year, to teach ethical standards and controversies regarding the use of technology, as well as stress appropriate researching strategies that hone in on legitimate sources of information and limit the possibility of plagiarism. These strategies should be reinforced by upper-level teachers throughout a student's high school experience.

These ideas will be brought to my current principal during my end-of-year meeting, and plans for improvement will begin at such time. This meeting will allow me to present my ideas to the proper administrative authorities, as well as clarify the financial possibilities for such investment.

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Appendix A
Example Teacher Survey

1. How would you describe your overall proficiency with computers and technology in general?

- ☐ Expert

 ☐ Average

 ☐ Poor
☐ Above Average

 ☐ Below Average

2. How often, in an average day, are you on the computer?

- ☐ More than 5 hours

 ☐ I do not use a computer on a daily basis
☐ 3-5 hours
☐ 1-2 hours

3. What, generally, do you use the computer for? (Check all that apply)

- | | |
|---|--|
| <input type="checkbox"/> Work | <input type="checkbox"/> Playing Games |
| <input type="checkbox"/> News/Information | <input type="checkbox"/> Art/Photography |
| <input type="checkbox"/> Email | <input type="checkbox"/> Shopping |
| <input type="checkbox"/> Internet Communities | <input type="checkbox"/> Other |

Please explain any "other" responses:

4. How many computers are in your home? _____

5. Do you have Internet access at home? Yes ☐ No ☐

6. How long have you been using a computer on a regular basis?

- ☐ More than 15 years

 ☐ 5-10 years

 ☐ Less than 2 years
☐ 10-15 years

 ☐ 2-5 years

7. Did you use a computer prior to entering college? ☐ Yes ☐ No

8. Which of the following programs do you have at least some experience in using?

- | | | |
|---|--|---|
| <input type="checkbox"/> Microsoft Word | <input type="checkbox"/> MS FrontPage | <input type="checkbox"/> Adobe Photoshop <input type="checkbox"/> |
| <input type="checkbox"/> Microsoft Excel | <input type="checkbox"/> MS MovieMaker | <input type="checkbox"/> Adobe Illustrator <input type="checkbox"/> |
| <input type="checkbox"/> Microsoft PowerPoint | <input type="checkbox"/> PodCasting Software | <input type="checkbox"/> Other Website Creation |
| <input type="checkbox"/> Microsoft Publisher | <input type="checkbox"/> Apple GarageBand | |

9. Which best describes the amount of computer use required by students in your class.

- ☐ My students are not asked to use the computer for my class.
- ☐ Primarily typing papers and some Internet research
- ☐ Primarily typing papers and extensive Internet research
- ☐ In addition to typing papers and doing Internet research, some assignments use various computer applications

10. Check all computer applications below that you have REQUIRED students to use for your class:

- | | | |
|--|--|--|
| <input type="checkbox"/> Microsoft Word | <input type="checkbox"/> MS FrontPage | <input type="checkbox"/> Adobe Photoshop |
| <input type="checkbox"/> Microsoft Excel | <input type="checkbox"/> MS MovieMaker | <input type="checkbox"/> Adobe Illustrator |
| <input type="checkbox"/> MS PowerPoint | <input type="checkbox"/> PodCasting Software | <input type="checkbox"/> Other Website |
| <input type="checkbox"/> Microsoft Publisher | <input type="checkbox"/> Apple GarageBand | Creation |

11. Check the statement below that best describes your opinion on the importance of using computers in the classroom.

- ☐ I like having students use the computer, but I don't think they learn any better with its use.
- ☐ I like having students use the computer, and I think they learn more from its use.
- ☐ I don't like having my students use the computer for school assignments.

12. Check the statement below that best describes your opinion on the frequency of computer use in the classroom.

- ☐ I think students should use the computer more often in more classes.
- ☐ I like the way classes are now in regards to computer use.
- ☐ I think students should use the computer less frequently in the classroom.

13. Check any of the following that hinder the use of computers in your classroom:

- ☐ We don't have adequate access to computers for more extensive use in my classroom.
- ☐ I need more training on various computer programs.
- ☐ I don't know how to adequately design lessons that incorporate current technologies.
- ☐ I'm comfortable with the lessons that I currently have for my students.

14. Check the MOST PROMINENT reason why computers are not used more in your classroom:

- ☐ We don't have adequate access to computers for more extensive use in my classroom.
- ☐ I need more training on various computer programs.
- ☐ I don't know how to adequately design lessons that incorporate current technologies.
- ☐ I'm comfortable with the lessons that I currently have for my students.

Please provide an anonymous breakdown of student performance in your class over the first two quarters. Remember that your name and the names of your students will not be matched to these findings. Grades will only be compared between honors and non-honors students, and to look for patterns in technology use and student performance. You must only provide listings for freshmen classes, regardless of whether you teach additional grade levels.

Freshman Class #1 : <input type="checkbox"/> Honors <input type="checkbox"/> ACP		Freshman Class #1 : <input type="checkbox"/> Honors <input type="checkbox"/> ACP	
First Quarter		Second Quarter	
#As		#As	
#Bs		#Bs	
#Cs		#Cs	
#Below C		#Below C	
Freshman Class #2 : <input type="checkbox"/> Honors <input type="checkbox"/> ACP		Freshman Class #2 : <input type="checkbox"/> Honors <input type="checkbox"/> ACP	
First Quarter		Second Quarter	
#As		#As	
#Bs		#Bs	
#Cs		#Cs	
#Below C		#Below C	
Freshman Class #3 : <input type="checkbox"/> Honors <input type="checkbox"/> ACP		Freshman Class #3 : <input type="checkbox"/> Honors <input type="checkbox"/> ACP	
First Quarter		Second Quarter	
#As		#As	
#Bs		#Bs	
#Cs		#Cs	
#Below C		#Below C	
Freshman Class #4 : <input type="checkbox"/> Honors <input type="checkbox"/> ACP		Freshman Class #4 : <input type="checkbox"/> Honors <input type="checkbox"/> ACP	
First Quarter		Second Quarter	
#As		#As	
#Bs		#Bs	
#Cs		#Cs	
#Below C		#Below C	

Appendix B
Example Student Survey

1. How would you describe your overall proficiency with computers and technology in general?

- | | | |
|--|--|-------------------------------|
| <input type="checkbox"/> Expert | <input type="checkbox"/> Average | <input type="checkbox"/> Poor |
| <input type="checkbox"/> Above Average | <input type="checkbox"/> Below Average | |

2. How often, in an average day, are you on the computer?

- | | |
|--|---|
| <input type="checkbox"/> More than 5 hours | <input type="checkbox"/> I do not use a computer on a daily basis |
| <input type="checkbox"/> 3-5 hours | |
| <input type="checkbox"/> 1-2 hours | |

3. What, generally, do you use the computer for? (Check all that apply)

- | | |
|---|--|
| <input type="checkbox"/> School Work | <input type="checkbox"/> Gaming |
| <input type="checkbox"/> News/Information | <input type="checkbox"/> Art/Photography |
| <input type="checkbox"/> Email | <input type="checkbox"/> Other |
| <input type="checkbox"/> MySpace (or similar sites) | |

Please explain any "other" responses:

4. How many computers are in your home? _____

5. Do you have Internet access at home? ☐ Yes ☐ No

6. Do you have your own computer? ☐ Yes ☐ No

7. How old were you when you first used a computer?

- ☐ I don't remember a time without computers
- ☐ Prior to elementary school
- ☐ Around the time of elementary school
- ☐ In middle school
- ☐ I only recently started using a computer

8. Check all computer applications below that you have at least some experience in using:

- | | | |
|---|--|---|
| <input type="checkbox"/> Microsoft Word | <input type="checkbox"/> MS FrontPage | <input type="checkbox"/> Adobe Photoshop |
| <input type="checkbox"/> Microsoft Excel | <input type="checkbox"/> MS MovieMaker | <input type="checkbox"/> Adobe Illustrator |
| <input type="checkbox"/> Microsoft PowerPoint | <input type="checkbox"/> PodCasting Software | <input type="checkbox"/> Other Website Creation |
| <input type="checkbox"/> Microsoft Publisher | <input type="checkbox"/> Apple GarageBand | |

9. For school use, I primarily use the computer for... (Check the most accurate description)

- ☐ Typing papers and some Internet research
☐ Typing papers and extensive Internet research
☐ I have many assignments, outside of my Writing Lab class, that use various computer applications

10. Check all computer applications below that you have been REQUIRED to use This Year In A Class outside of Writing Lab:

- | | | |
|--|--|--|
| <input type="checkbox"/> Microsoft Word | <input type="checkbox"/> MS FrontPage | <input type="checkbox"/> Adobe Photoshop |
| <input type="checkbox"/> Microsoft Excel | <input type="checkbox"/> MS MovieMaker | <input type="checkbox"/> Adobe Illustrator |
| <input type="checkbox"/> Microsoft | <input type="checkbox"/> PodCasting Software | <input type="checkbox"/> Other Website |
| <input type="checkbox"/> PowerPoint | <input type="checkbox"/> Apple GarageBand | Creation |
| <input type="checkbox"/> Microsoft Publisher | | |

11. Check all computer applications below that you have been REQUIRED to use IN THE CLASSROOM IN YEARS PRIOR TO YOUR FRESHMAN YEAR:

- | | | |
|--|---|--|
| <input type="checkbox"/> Microsoft Word | <input type="checkbox"/> Microsoft FrontPage | <input type="checkbox"/> Adobe Photoshop |
| <input type="checkbox"/> Microsoft Excel | <input type="checkbox"/> MS MovieMaker <input type="checkbox"/> | <input type="checkbox"/> Adobe Illustrator |
| <input type="checkbox"/> Microsoft | <input type="checkbox"/> PodCasting Software | <input type="checkbox"/> Other Website |
| <input type="checkbox"/> PowerPoint | <input type="checkbox"/> Apple GarageBand | Creation |
| <input type="checkbox"/> Microsoft Publisher | | |

12. Check the statement below that best describes your opinion of the use of computers in the classroom.

- ☐ I like using the computer, but I don't think I learn any better with its use in required assignments.
☐ I like using the computer, and I think I learn more from its use in required assignments.
☐ I don't like using the computer for school assignments.

13. Check the statement below that best describes your opinion on the use of computers in the classroom.

- ☐ I think we should use the computer more often in more classes.
☐ I like the way my classes are now in regards to computer use.
☐ I think we should use the computer less frequently in the classroom.

14. What is your favorite assignment that you have done all year in any of your classes?

15. Did this assignment require the use of technology? ☐ Yes ☐ No

Appendix C

Student Survey Results		
Overall Computer Proficiency	#✓	%✓
Expert	2	9%
Above Average	7	32%
Average	12	55%
Below Average	1	5%
	22	
Average Daily Computer Usage	#✓	%✓
More than 5 Hours	0	0%
3-5 Hours	14	64%
1-2 Hours	5	23%
Do Not Use a Computer Daily	3	14%
General Computer Use	#✓	%✓
School/Work	20	91%
News/Information	7	32%
Email	16	73%
MySpace (Or Similar Site)	15	68%
Gaming	7	32%
Art/Photography	10	45%
Other: music, game design, script design, programming, shopping	4	18%
# of Home Computers	#	%
1	4	18%
2	8	36%
3	5	23%
4+	5	23%
Home Internet Access	#Yes	%Yes
Response	22	100%
Own Computer	#Yes	%Yes
Response	12	55%
Age of Computer Introduction	#✓	%✓
I don't remember a time without.	5	23%
Prior to elementary school.	7	32%
Around the time of elementary school.	7	32%
In middle school.	3	14%
Only recently.	0	0%
Some Experience in the Following Applications	#✓	%
MS Word	22	100%
MS Excel	22	100%
MS PPT	22	100%
MS Publisher	18	82%
MS Frontpage	3	14%

Student Survey Results Continued		
MovieMaker	7	32%
PodCasting	8	36%
Garageband	2	9%
Photoshop	15	68%
Illustrator	4	18%
Web Creation	6	27%
School Primary Computer Usage	#✓	%✓
Typing Papers/Some Internet	8	36%
Typing Papers/Extensive Internet	8	36%
Many Assignments/Various Computer Programs	6	27%
Required Applications for School Assignments This Year*	#✓	%✓
MS Word	22	100%
MS Excel	15	68%
MS PPT	21	95%
MS Publisher	6	27%
MS Frontpage	1	5%
MS MovieMaker	0	0%
PodCasting Software	0	0%
Apple Garageband	0	0%
Adobe Photoshop	1	5%
Adobe Illustrator	0	0%
Other Web Creation Software	0	0%
Required Applications for School Assignments Prev. Year	#✓	%✓
MS Word	22	100%
MS Excel	20	91%
MS PPT	21	95%
MS Publisher	13	59%
MS Frontpage	1	5%
MS MovieMaker	1	5%
PodCasting Software	2	9%
Apple Garageband	0	0%
Adobe Photoshop	11	50%
Adobe Illustrator	1	5%
Other Web Creation Software	2	9%
Statement That Best Describes Your Opinion of School Computer Usage	#✓	%
Like/But does not improve learning.	5	23%
Like/And I learn more from its use.	16	73%
I don't like using the computer for school assignments.	1	5%

Student Survey Results Continued		
Statement That Best Describes Your Opinion of School Computer Usage	#✓	%
We should use more often.	12	55%
I like the current level of usage.	10	45%
We should use less frequently.	0	0%
Did Your Overall Favorite School Assignment This Year Involve Technology?	#Yes	%Yes
Results	22	100%
Teacher Survey Results		
Overall Computer Proficiency	#✓	%✓
Expert	0	0%
Above Average	4	57%
Average	2	29%
Below Average	1	14%
Average Daily Computer Usage	#✓	%✓
More than 5 Hours	1	14%
3-5 Hours	3	43%
1-2 Hours	3	43%
Do Not Use a Computer Daily	0	0%
General Computer Use	#✓	%✓
Work	7	100%
News/Information	6	86%
Email	7	100%
Internet Communities	3	43%
Playing Games	0	0%
Shopping	5	71%
Art/Photography	3	43%
Other (Explain)	0	0%
# of Home Computers	#	%
1	3	43%
2	2	29%
3	0	0%
4+	2	29%
Home Internet Access	#Yes	%Yes
Response	7	100%
# Years Computer Experience	#✓	%✓
More than 15	2	29%
10 to 15	2	29%
5 to 10	2	29%
2 to 5	1	14%
Less than 2	0	0%

Teacher Survey Results Continued		
Did you use a computer prior to entering college?	#Yes	%Yes
Response	3	43%
Some Experience in the Following Applications	#✓	%✓
MS Word	7	100%
MS Excel	6	86%
MS PPT	5	71%
MS Publisher	0	0%
MS Frontpage	0	0%
MS MovieMaker	0	0%
PodCasting Software	0	0%
Apple Garageband	0	0%
Adobe Photoshop	3	43%
Adobe Illustrator	0	0%
Other Web Creation Software	1	14%
Primary Computer Usage For Your Course	#✓	%✓
Typing Papers/Some Internet	4	57%
None	3	43%
Many Assignments/Various Computer Programs	0	0%
Required Applications for School Assignments This Year	#✓	%✓
MS Word	5	71%
MS Excel	0	0%
MS PPT	4	57%
MS Publisher	0	0%
MS Frontpage	0	0%
MS MovieMaker	0	0%
PodCasting Software	0	0%
Apple Garageband	0	0%
Adobe Photoshop	0	0%
Adobe Illustrator	0	0%
Other Web Creation Software	0	0%
Statement That Best Describes Your Opinion of School Computer Usage	#✓	%
Like/But does not improve learning.	1	14%
Like/And I learn more from its use.	5	71%
I don't like using the computer for school assignments.	1	14%
Statement That Best Describes Your Opinion of School Computer Usage	#✓	%✓
We should use more often.	3	43%
I like the current level of usage.	4	57%
We should use less frequently.	0	0%

Teacher Survey Results Continued		
All Hinderances to Increased Use of Computers In Your Classroom	#✓	%✓
We don't have adequate access to computers for more extensive use in my classroom.	4	57%
I need more training on various computer programs.	3	43%
I don't know how to adequately design lessons that incorporate current technologies.	3	43%
I'm comfortable with the lessons that I currently have for my students.	3	43%
Primary Hindrance to Increased Use of Computers In Your Classroom	#✓	%✓
We don't have adequate access to computers for more extensive use in my classroom.	2	29%
I need more training on various computer programs.	1	14%
I don't know how to adequately design lessons that incorporate current technologies.	1	14%
I'm comfortable with the lessons that I currently have for my students.	3	43%

Congress Comes to the Sixth Grade (A Role-Play Exercise)

Andrew Campbell

Education 590, Spring 2007

The University of Tennessee at Chattanooga

The Institutional Review Board of The University of Tennessee at Chattanooga (FWA00004149) has approved this research project 07-034.

Introduction to the Problem

I can remember most of the teachers that I have had at one point or another in my educational career. Some teachers I found to be very good at what they were trying to accomplish, while others were not as successful, in this regard. The best teachers I have ever had were able to convey to their students what they desired to teach to us. The styles these teachers incorporated varied, but most were able to make use of multiple methods to teach us what they wanted. As a teacher, it is important that I learn to use other methods to supplement the lectures that I will give to my classes. While I, personally, prefer lecture, I understand that many students would benefit from a variety of teaching methods in a class, and I incorporate these, when appropriate. I have personally experienced the benefits that a role-playing scenario can provide to a class. Thus, I will attempt a role-play project and observe in this role-play exercise what helps students to learn, and then determine from observation and student feedback whether the exercise was a success academically, as is, or whether changes would be beneficial to future attempts at a role-play exercise in the classroom.

Area of Focus and Research Questions

The purpose of this study is to describe the effect of allowing students in a sixth-grade citizenship class to participate in role-playing government activities instead of simply listening to lecture in class. I wish to observe whether this action has any effect upon student performance, attentiveness, or participation.

In order to determine the effectiveness of allowing students to participate in a role-playing scenario, the following questions will be answered. What is the effect on

student enthusiasm and participation of allowing students to role-play? What is the effect upon student performance of allowing students to role-play? Are there any ways that I might improve upon this activity, if I were to attempt it again?

Review of Literature

The literature reviewed for this project has provided several important tips and instructions for completing a successful role-play scenario. “A good role-playing exercise builds on knowledge that students already possess about a particular historical context” (McDaniel, 2000, p. 357). This is the first of many lessons learned from the literature. This also provides some basis for using this experiment as a supplement to lecture, rather than as a replacement.

One point that became very obvious from the literature was the importance of planning. One piece of literature provided a full lesson plan, complete with the objectives of the scenario (Woodward, 2003). Planning is the most important part of the role-play process. Without planning, the scenario will not work as well as it should. Role-play can also take large amounts of time, and, thus, it is important to select scenarios that help illustrate an important section of the course (Monahan, 2002). Thus, such projects need to be used at important times, or they may otherwise waste valuable time.

Allowing students to participate in role-play provides opportunity for a deeper level of thought which is often lacking in lecture. When students become involved in role-play, they are allowed to see things from other points of view, and asked to think outside the box. Students become engaged in active, rather than passive, learning. “Active learning refers to experience in which students are thinking about subject matter as they interact with the instructor and each other” (McCarthy & Anderson, 2000, p.

279). When choosing the topic, it is important to select one which will maximize student involvement, and, where possible, promote some type of conflict (McDaniel, 2000). A very good example of this was a project done in a college political science class. The class essentially ran a political campaign over a 10-week period, with students playing the roles of candidates, staff and media (Kathlene & Choate, 1999). While not an example to use in a sixth-grade citizenship class, it is a great example of conflict in a role-play scenario.

Another point brought out in the research was the tendency for students to enjoy the role-play experience (Monahan, 2002). Students may also take the role-play experience very seriously, at times. This is best illustrated by the campaign scenario where the students began to take things almost too far (Kathlene & Choate, 1999). Whether sixth-grade students will carry a role-play scenario that seriously is questionable, but the research does suggest such scenarios to be enjoyable in which to participate.

Unfortunately, most of the literature reviewed contained examples for college level classes. A few were made for high school history classes, but none were made for middle-school-level citizenship classes. However, the literature did point to the importance of planning, as well as to the need to choose topics with importance to the class, and of which the students already have some knowledge. The research also indicates that students tend to enjoy role-play activities, and, thus, such a scenario might be a good addition to lecture.

Research Questions

What is the effect upon student participation or enthusiasm of allowing students to participate in a role-play scenario? To determine the effects, if any, on student participation or enthusiasm, I will first observe and note any change in student enthusiasm or involvement when they are engaged in the role-play scenario. If the students appear to be more enthusiastic or involved than they normally are, then it will be seen as a positive effect. If students seem disinterested or uninvolved, then it will be noted as a negative effect. I will then have a wrap-up time after the experiment, during which I will ask students whether they thought this role-play scenario was a useful tool, or a complete waste of time. This can be done by either asking them as a group, or through a questionnaire.

What is the effect upon student performance of allowing them to participate in a role-play scenario? To determine the effects, if any, on student performance, I will first quiz the students for prior knowledge about the topic that the role-play scenario covers. After the scenario is complete, I will again quiz the students to determine if they have learned what the scenario was intended to teach. If there is improvement in quiz scores, then it will be seen as a positive effect. If not, then it will be seen as a negative effect. I will also ask students after the role-play is finished whether they think they have learned anything from the scenario.

Are there any ways that I might improve upon this activity if I were to attempt it again? This question may prove to be the most difficult to answer. If the role-play scenario provides positive effects upon my students, then it is likely that I will again use

it or similar activities. If the scenario does not provide positive benefits, then I will not likely use it again. The difficulty lies in determining how to improve the role-play scenario. I can take the feedback given by the students to determine what areas of the scenario need to be reworked.

Data Collection and Results

The Plan and Methodology

The role-playing scenario I have chosen involves the passing of multiple bills in a mock session of the United States Senate. The students involved in this exercise have previously had little exposure to how the House of Representatives or Senate actually goes about making laws for the United States. Because of this limited exposure to the material, the students will be given a short explanation of how the process works. However, to test to see how much students can learn by using the role-play exercise alone, students will not be given anything more beyond this brief explanation of the process.

In order to determine the extent of the students' prior knowledge of Congress, the first part of this exercise will be a pre-quiz. This quiz will give the instructor an idea of how much students already know. This quiz is not be heavily detailed, and consists of 10 questions about how bills become laws. Since these are sixth-grade students, with very limited or no exposure to the material, this quiz only covers the basic information needed to grasp how the lawmaking process operates.

After the pre-quiz has been given, students will then be split into small "teams" of three or four students. These teams are responsible for doing the following. First, each team needs to create five possible bills. These bills must contain three "real world" bills

along with two bills which deal with a fun day for the students. One of the real world bills may deal with school-related issues, but at least two must deal with issues outside the school environment. The students consult with their fellow team members to determine what bills they wish to create. The instructor, during this time, is walking around from team to team, answering questions or giving advice to students. The teams must get approval from the instructor for each bill. The fun day bills must follow school rules. Any that do not must be replaced with bills that do. The pre-quiz and bill creation process will take around 1 to 1 1/2 hours of class time to implement. This can be done in one period of a block schedule or in two class periods on a traditional schedule.

The next phase of the project is designed to mirror the committee system that is present in both the House and Senate in Congress. The teams are now combined with one or two other teams. This creates either three or four larger groups which are called committees. These committees are now charged with determining which bills will be “killed” in committee and which will be brought before the class for debate and vote. Each team will present their bills to their committee, and, after all bills have been heard, the committees will be required to omit bills until they have brought the number down to three real world bills (one of which may be school related) and two fun day bills. The students decide for themselves how they will choose which bills to take before the class as a whole, but they must decide on just the five they are allowed. All other bills are thus killed in committee. This phase of the project will take a similar amount of time as the first phase. It can be done in one block period or two normal periods. The instructor will again move from committee to committee to make sure that the students understand the process and are doing what they should be doing.

The third phase involves bringing the class together. The entire class now becomes as the floor of the Senate. The class or “Senate” now has two goals they must accomplish. First, the class will debate proposed bills from each committee. Depending upon the time a teacher wishes to devote to this phase, each bill may be debated, or a sample can be taken from each committee. The second goal for the students is to decide what their fun day is going to be. The students are allowed to debate, and do so by raising their hand if they have a comment to make. The instructor will play the role of mediator, and will determine when students are allowed to speak. Students who wish to speak must first say whether they are for or against the bill, and then give reasoning to back up their opinion. The teacher must decide when to cut off debate on a bill. Otherwise, more time may be spent on debate than the teacher wishes. After debate has been finalized, the students then vote. A 50 percent vote is required to pass a bill. Students may vote yes or no, or may abstain, if they wish. In the case of a tie vote, the teacher must decide how the tie will be broken. Some possibilities would be that the teacher will have the tie-breaking vote, or a vice-president may be elected from the students whose job it will be to break tie votes.

Bills that are passed by the class must now go to the President’s desk to be either signed or vetoed. The teacher must again decide how this process will work. A President may be elected from among the students. This student may not debate or vote on the floor, but may give comment after signing or vetoing the bill. The teacher may also act as President, or may bring in another teacher or individual to act as President. If a bill is signed by the President, then it will become law. If it is vetoed, then it will go back to the floor for students to again debate. If the President gives suggestions for alterations to the

bill, then the class can debate those. If no alterations are made, a second vote by students must reach a two-thirds majority to override the veto. If this cannot be reached, then the bill dies. If alterations are discussed and passed, the President can then sign or veto again.

The rules for the fun day are slightly different than those for the real world bills. The teacher will have an absolute veto power over any such bill that the students pass. All of these bills will be brought before the students to be debated and then a vote will occur. The bill with the highest yes vote will be considered to be the students' top choice. If the teacher has no problem with the choice, and if no school rules are violated by the bill, then it may be signed. If not, then the next bill in line in terms of yes votes will be considered. The first one thus passed will be considered a law, and the students will thus have chosen a fun day via the lawmaking process (though slightly modified). This phase will likely be, by far, the most time-consuming of the process. The teacher must choose how much time to devote to this phase.

The final phase involves giving the post-quiz and the student survey. The post-quiz scores will be compared to those of the pre-quiz to determine how much students have learned from the activity. The survey will be given to help give the teacher a feel for how much the students enjoyed or disliked the process. These, along with teacher observation of the process, will help give an idea of how to modify and improve the exercise for future use, if so desired. After this is complete, the teacher should then debrief the class. This consists of a discussion with the students about what worked and what did not. Students will be encouraged to talk with the class about what they learned, and enjoyed or disliked, about both the exercise and the lawmaking process as it exists in this country.

Implementing the Plan

The above project was given to two sixth-grade classes. The students were learning basic government, and this project was designed to help students learn about how laws are made. The students were only given a very basic introduction to Congress. The students then went through the process described above.

Because this project was done as part of the author's student teaching experience, there was also a cooperating teacher present for the entire exercise. Thus, the author was able to incorporate the teacher into the project. The teacher was given the role of President. Thus, the teacher was first able to veto and give suggestions and feedback to students without being in a normal teacher-student role. This also meant that the teacher had final say in what the fun day would be, thus freeing the author from a possible conflict with school rules. The author played the role of mediator, and also had the tie-breaking vote, if one was required. This project took 6 class days to complete, not including the fun day that the students chose. Data was collected from a pre-quiz, post-quiz, and student survey, as well as observations made by the author.

Data Collection

The following table lists for the reader the results of the pre-quiz, post-quiz, and student survey. Only students who gave written permission, whose parents gave written permission, and who were present during each of the instrument administrations have information recorded in the table. These students will only be identified by a number (see figure 1). Some students do not have an answer for the fourth question in the survey due to a technical glitch. The pre-quiz/post-quiz is located in Appendix A. The student survey is located in Appendix B.

Student	Pre-quiz	Post-quiz	Questions Missed	Differential	Survey
1	30	50	2,4,5,7,8	+20	4,3,3,3,3
2	40	50	1,2,4,5,9	+10	4,4,5,*,5
3	30	40	1,2,4,5,7,8	+10	4,5,4,*,5
4	50	80	2,4	+30	4,5,5,*,3
5	20	50	1,2,4,5,7	+30	5,4,5,*,5
6	40	60	2,4,5,7	+20	4,5,5,*,5
7	20	50	1,2,4,5,10	+30	4,5,5,*,5
8	50	80	7,8	+30	4,3,2,3,1
9	40	70	1,4,5	+30	4,5,4,5,5
10	30	70	1,2,4	+40	5,3,2,*,3
11	40	50	1,2,5,8,10	+10	3,4,5,5,4
12	20	50	1,2,4,7,8	+30	5,1,3,5,5
13	60	80	5,8	+20	4,5,3,5,4
14	60	100	none	+40	4,4,5,5,5
15	60	70	2,4,5,8	+10	4,5,4,5,5

Figure 1. Student quiz and survey data.

Analysis and Results of Data

Student scores for the pre-quiz were about what should be expected of students who have not had much exposure to the topic of Congress. Some students did relatively well, but not high enough to be considered a passing grade. The questions covered basic information that any individual should know in order to be able to explain how the lawmaking process works. From the above data, it can be concluded that most, if not all, of the students could not explain in much detail or with accuracy how laws are made.

The post-quiz scores were better than those of the pre-quiz. Most students scored between 20 and 30 points higher on the post-quiz. Students had the most difficulty with the two questions asking for the percentage to pass a bill and the percentage needed to override a veto. The other question many students missed was the question about how many Senators there are in the U.S. Senate. The reason for this was that the students were not required to take any notes or listen to a lecture over this process, and, thus, many never remembered discussing this in the project. The questions dealing with the process

of lawmaking were, for the most part, the ones that most students got correct on the post-quiz. Because this is what the project mostly focused upon, this is not surprising.

The survey showed the following observations. First, almost every student reported that the role-play exercise helped them to grasp how the lawmaking process works. Out of all the survey questions, this is the one that students agreed upon the most. Second, most students thought that the exercise was a good use of class time. One student strongly disagreed with this assertion, and a few were neutral on this issue. Third, most students also agreed that they would learn more from doing this exercise than they would without doing the exercise, or by learning it in some other fashion. A few students disagreed with this assertion. Fourth, those students who had the opportunity to answer the fourth question reported enjoying the exercise. Two students were neutral on this question, while the rest strongly agreed with the question. However because not all students answered this question, it is harder to draw a conclusion. Finally, most students also reported a strong desire to participate in more role-play exercises in the future. One student strongly disagreed, and several were neutral, but most showed a desire to become involved in similar exercises.

Conclusions and Recommendations

Conclusions

After looking at the data from the quizzes and survey, as well as notes that were made while the students were engaged in the process, the author has made a few observations. First, the students, although somewhat confused at the start of the exercise, were certainly heavily involved in the exercise. This is especially true of the Senate floor phase of the project. The students, after understanding what they were doing, gradually

opened up and created some very good bills. In fact, some of them were quite surprising and very well thought out, with some being rather remarkable, considering these were created by sixth graders. The students were especially attentive during debate, and the author was forced to cut off debate on several bills in order to move the class along with other tasks.

Second, the students seemed to enjoy the project. Although there were several disagreements over bills, the students were generally respectful and very engaged. The students looked to be very excited about the process, this being observed by the author and shown by responses on the survey. Almost every student became involved in the debate over the bills, and some of the votes were very close (there was one tie vote which the author passed). The students responded to each other's comments in a respectful manner, and the students listened to each other in order to decide how to respond to one another. Students would groan if a bill they wanted was killed, and would even cheer when a bill was passed or a veto was overridden.

The cooperating teachers also helped to encourage the students. Both vetoed popular bills, and this led to many rather humorous confrontations between the teachers and their classes. Also, some bills were very heavily debated. The best example of this was a proposed bill to change the school from a traditional year schedule to a year-round school schedule. After the differences between these two schedules were explained to the students, a lengthy debate ensued, with most of the students giving their opinions about the bill.

The third observation is that the students would like to do more role-play exercises. While not all students were heavily involved, the vast majority reported a

desire to become involved with similar projects, and observation of student participation backed up this reported desire. It would seem that these students enjoyed being put in a position to make choices and decisions.

Finally, by looking at student quiz scores and by observing different phases of the project, there are a few changes that should be made to make the project run more smoothly, if used again. These will be discussed in the next section.

Recommendations and Changes

If this project were to be repeated, the author would make a few changes to make the project run more smoothly. The first of these would be to spend a little more time getting the students ready to participate in the project. Students need to be given a greater amount of preparation before the role-play begins. A list of terms, definitions and facts would certainly help to clear some of the confusion that some students showed early in the process.

Another change would be to either have a President and Vice-President elected from among the students, or to find some other way to give the students a little more control over the making of laws. While the teacher must still have final say over the fun day aspect of the project, allowing the students to select a leader who would then have veto power might add another dimension to this role-play. Perhaps the class might even get to attempt an impeachment if the President they elected decided to veto everything.

Another possible twist would be for students to each create their own bills, and then to set up committees to deal with different categories of bills. The exercise as done by the students did not give any reason for wanting to make such a change, but such a change might simply give students an extra layer of the project.

Finally, it would probably be very wise to plan an extra day or two into the schedule to deal with the debates. Either more time needs to be given to this phase, debating must be cut short, or only a few bills will be debated. The students became very involved in debating, and, on almost every bill debated, the debate had to be cut short in order to give each committee a chance to give a few bills for debate. Thus, it is recommended that at least 3 days be given to this phase.

If teachers desired to copy this project or create a similar one, the author recommends that teachers spend the time to thoroughly plan the project. If teachers wish to use this project, specifically, then please pay attention to the plan and changes to the plan which the author would make, if running this project again. To the author's knowledge, there is no known grant money for further study into this subject. This project was designed to be used in a technology-poor environment. If students were to do research on possible bills, then computers and Internet access would prove invaluable in doing so. Otherwise, the project does not need, nor was designed, to incorporate the use of computers in the classroom.

Final Remarks

It is the opinion of the author that this exercise was beneficial to the students involved. The students became engaged in a process that few of them understood at the beginning. The students had the opportunity to discuss issues they normally would not, and they were also able to engage with their teachers and classmates on an even playing field. This project could also be used at other grade levels, and the author plans to use this, or a similar project, if he ever has the opportunity to teach this material in another classroom.

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Appendix A

6th Grade Citizenship - Congress Quiz

1. What percentage of a vote is needed in order for a bill to be passed from either the House or the Senate?
2. How many Senators are there in the U.S. Senate?
3. True or False. The President can veto as many bills as he wants.
4. What percentage of a vote is required to overturn a veto?
5. What branch of the government is in charge of determining the constitutionality of any law passed?
6. What is a veto?
7. What is a bill?
8. Who can create a bill?
9. Does a bill have to go through a committee?
10. Does a bill have to be voted on by both the House of Representatives and the Senate?

Appendix B

6th Grade Citizenship – Student Survey

Directions: Answer the following questions on a scale of 1-5, with 1 being strongly disagree or strongly dislike, 2 being moderately disagree or dislike, 3 being neutral or no opinion, 4 being moderately agree or like and 5 being strongly agree or like.

1. This role play exercise helped me to understand how laws are made in the U.S.

2. I think this role play exercise was a good use of class time. _____
3. I think that I learned more from doing this role play than I would have learned without participating in it. _____
4. I liked doing this role play exercise. _____
5. I would like to do more role play exercises in the future. _____

Factors behind Students' Bad Behavior at School

Nighat Jonathan Cecil

Education 590, Spring 2007

The University of Tennessee at Chattanooga

The Institutional Review Board of The University of Tennessee at Chattanooga (FWA00004149) has approved this research project 07-012.

Introduction to the Problem

As a substitute teacher, the researcher went to work in many schools and classrooms. She observed increasing violence, cheating, bullying, and misbehavior, including cursing out teachers, talking back to teachers, and disobedience to teachers on the rise among students. Future generations should have strong character to build strong nations. All these observations led to the research on the factors leading to the bad behavior of the students. The bad behavior of students is a current national issue. Due to this problem, a lot of time is wasted in the classrooms. Troublemakers not only waste their time, but the time of the fellow students, too.

Review of Literature

Herrenkohl et al. (1995, 1993, 1996), cited in Bennett, Elliott, and Peters (2005), said that children from low socioeconomic status (SES) backgrounds experiencing the stresses of economic hardship are at risk for a number of maladaptive outcomes. In early childhood, gender is associated with greater risk for social and behavioral problems. Boys are especially likely to display outward aggression. Smith and Carlson (1997) suggested (as cited in Bennett et al.) that boys are also more likely to engage in antisocial behavior as a result of life stress. Turner and Piquero (2002), cited in Bennett et al., said that older children are less likely to experience problems with self-control.

According to Bennett et al. (2005), in the fall of 1998, over 21,000 children enrolled in 995 schools nationwide were sampled for the study titled The Early Childhood Longitudinal Study. The US Department of Education (2006) conducted this study. The dependent variables included externalizing behaviors and self-control. Five items, including arguments, fights, getting angry, acting impulsively, and disturbing

ongoing activities, represent externalizing behavior. The four-item, self-control scale includes respecting the property rights of others, controlling temper, accepting peer ideas for group activities, and responding appropriately to peer-pressure. The five variables included a measure of family socioeconomic status. This composite measure took into account the father's or male guardian's education and occupation, the mother's or female guardian's education and occupation, and the overall household income. The second variable was the gender representation by dichotomous measure. The third variable measured minority status. The fourth student background variable was child age measured in months.

Results of the Bennett et al. (2005) study indicated that lower socioeconomic status was consistently associated with more externalizing behavior. Girls were significantly less likely than boys to exhibit increased externalizing behavior. Younger children were at relatively high risk for increasing externalizing problems. There was a cross-level interaction between child gender and classroom behavior. In this case, the cross-level interaction tested the multiplicative effects of the individual child's gender times the teacher's rating of classroom behavior. A value of -0.84 was predicted for female gender in the regression models regarding externalizing problems. However, as the classroom behavior became more unmanageable, the gap in externalizing problems between boys and girls began to close. Among the student background factors, being from low socioeconomic status family, being male, and being younger predicted greater externalizing problems and decreased self-control. Particularly, the benefit of being female is nullified in a classroom where misbehavior is frequent.

Burton, Ray, and Mehta (2003) demonstrated that older children evaluated the responder (peer being influenced) as being more susceptible to peer pressure (e.g., cheating) than did younger children. The older children also reported higher incidences of cheating, being less upset evaluating the various peer pressure situations, and being more likely to be influenced, themselves, than did younger children. Gender differences emerged, with girls being more upset than boys while evaluating the various peer pressure situations. It has become clear that not all peer interactions and peer influences are positive. The children influence each other to engage in various negative activities. According to Burton et al., some researchers (Brofenbrenner, 1970; Steinburg, 1986) report peer influence to be largely negative, particularly in the absence of adult supervision. Akers (1977), Elliott, Huizinga, and Ageton (1985), and Miller (1958) reported that the theories of deviance and delinquency have placed considerable emphasis on the negative influence of the peers (Burton et al.).

Parker & Asher (1987), cited in Burton et al. (2003), decided that, while childhood is a time where fundamental skills of social competency are learned, children also learn inappropriate behaviors from their peers. Sutherland & Cressey (1970), cited in Burton et al., suggested that many of the disobedient behaviors the children engage in are committed in parties of two or more. Kandel (1978) reports that friends facilitate negative behavior in each other, resulting in academic cheating and showing disrespect to authority figures (cited in Burton et al.). Peers use different social powers to manipulate each other. The reward power (spending time with the friends) can become a persuasive force to become involved in negative behaviors. The Berndt and Savin-Williams (1993) and Cohen (1983) studies have revealed similar findings, concluding that, by associating

with deviant peers, individuals may, (cited in Burton et al.) themselves, engage in deviant activities because their peers have facilitated and reinforced beliefs in them that delinquent activity is not wrong.

The research of Elliot et al. (1985) has demonstrated that the modeling and reinforcement powers required to produce antisocial behaviors come from an individual's peers

(cited in Burton et al., 2003). The influence in a best-friend relationship can be a mutual process. Each child influences his or her friend and is, in turn influenced by them. The girls reported being more upset than did boys in the positive reinforcement and negative reinforcement peer influence scenarios.

According to Burton et al. (2003), researchers have found that friends encourage their friends to engage in the undesirable and antisocial acts, e.g., fighting, smoking, and drugs. According to Burton et al., researchers e.g., Berndt (1996), and Steinberg and Silverberg (1986) demonstrate that conformity to the peer influence increases from middle childhood to middle adolescence (about age 15) and then decreases in the late adolescence. As the children age, they begin spending more time in the company of their peers than with their parents. Berndt (1979) found that conformity to peers' antisocial behavior increased greatly between third and ninth grade. The research done by Brown, Clasen, and Eicher (1986) and Hartup (1983) has shown that, with age, there is a steady increase towards misconduct, and the older children perceive the negative behaviors as normative (cited in Burton et al.). According to Burton et al., the unpopular and marginal-status children would be more influenced than would popular and average-status children.

Ray & Cohen (2000) demonstrated that girls and younger children are more likely to report the peers they evaluate, particularly the peers that have been wronged (i.e., aggressed against) as being more emotionally affected (more upset) than do boys and the older children (cited in Burton et al.). Thus, the older the child, the less they are going to be upset about an incidence that occurs every day around them, and in which they, themselves, are more likely to engage.

According to McFarland (2001), it is helpful to relate the story of a particularly rebellious classroom that was observed during the 1996-1997 school year. It was Algebra 2 class. Ellis, the teacher, wanted the students to understand the material and derive mathematical formulas, not just practice drills. Ellis used group and seatwork activities that called upon students to collaborate and learn from one another. Ellis did not make any effort to relate the materials to the students' personal lives, thereby never interesting the students in the subject matter. The teacher avoided students' questions by saying, "Read the book. It's in the book." He was not willing to help the students. As the semester progressed, the students began to tease and mock the teacher openly. The students deviated from tasks, colluded on cheating, and passively resisted the teacher through jokes and complaints. Detentions did little to manage disruptive behavior. The students undermined his authority by reducing his effort at control to jest. One day, the teacher asked a student to be quiet, and the student responded by saying, "You be quiet!! Nobody understands you or wants to listen to you." Eventually, students threw a textbook out of the third-floor window. They had a snowball fight in the class. They defied the teacher's requests that they should go to the principal's office. They repeatedly argued with him, and openly ridiculed him. The case study is an example of how can a classroom

move from a setting with passively resistant youth to one characterized by sustained defiance and, even, moments of outright, collective rebellion.

Hallinan (1989), Stodolsky (1988), Bossert (1977), and Metz (1978) suggested that teachers could also use task structures to maintain greater or lesser control over interaction

(cited in McFarland, 2001). According to McFarland (2001), topics irrelevant to everyday student life, and student-centered (or open) tasks, such as group work, discussion, and student presentations, lead them to rebellious actions. As a result overall disruptiveness increases. In contrast, teacher-centered (or closed) tasks, such as lectures, recitation, and exams, give the teacher rigid control over access to discourse. Moreover, it is easier to monitor student behavior during teacher-centered tasks than during student-centered tasks.

Traynor (2002) says that classroom order is a persuasive problem and a particular issue for the school community. The teachers interact with the students, using a variety of strategies to maintain an orderly classroom environment. Some strategies may be pedagogically sound, but others may not be sound. Five such strategies are labeled as coercive, task-oriented, laissez-faire, authoritative, and intrinsic. A teacher using the coercive strategy to maintain order uses intimidation and expressions of anger. This approach is characterized by the use of sarcasm, yelling, threatening students, and demeaning students. Moore et al. (1967) have demonstrated that coercive strategy has been shown to have devastating effects on children (cited in Traynor, 2002). Collette and Chiapette (1989) add that once the students recognize that the things are not under

control, they are apt to create more problems that incite further misbehavior (cited in Traynor, 2002).

According to Traynor (2002), the *laissez-faire* strategy for classroom order is characterized by geniality and teacher's tolerance of disruptive behavior. The teachers using this strategy believe that their acceptance as peers of the students is directly related to the gain of student respect toward them. This respect, in turn (they believe), is related to student compliance. This *laissez-faire* strategy for classroom order appears to avoid evoking misbehavior from students, but it appears to fail to challenge the students to grow intellectually. Cusick (1983) noted that no student-teacher conflicts, fights, or cases of insubordination showed up in the office (cited in Traynor, 2002).

Collette and Chiapette (1989) found that, by using the authoritative strategy, the teacher manages the students' behavior by enforcing a specific and reasonable set of classroom rules (cited in Traynor, 2002). Gaddy and Kelly (1984) suggest that firm, fair, and sensitive policies are the key components in establishing and maintaining school discipline (cited in Traynor, 2002). Walker, Colvin, and Ramsey (1995) add that gentle reminders of agreed upon behaviors, redirecting aberrant students in a nonconfrontational way using polite redirecting comments, serves a teacher well to maintain appropriate classroom order (cited in Traynor, 2002).

Traynor (2002) suggests that the goal of the intrinsic strategy for classroom order is to increase student self-control. Collette and Chiapette (1989) noted that the use of a reward (e.g., praise, affection, or gold star), immediately following the desired behavior, might characterize this approach. The introduction of this reward, in response to the

students' unsolicited behavior, would increase the frequency of the desired behavior in the future (cited in Traynor, 2002).

According to Traynor (2002), if the material, itself, is engaging and meaningful, there is far less likelihood of other competing classroom stimuli triggering inappropriate behavior. Gettinger (1988) identified quality instruction as one of the earliest proactive strategies that should be considered in classroom management (cited in Traynor, 2002). Walker et al. (1995) point out that fewer problems occur when the students are fully engaged academically (cited in Traynor, 2002). Daniels (1994) briefly reviews the studies indicating that a ratio of recognition events to punishments of at least 4:1 in classrooms leads to good discipline, while ratios smaller than this are associated with problems. Central technologies for encouraging respectful action include recognition and the use of group rewards for intervals in which only respectful action occurs (cited in Mattaini, 2001).

Among the five strategies for maintaining classroom order (cited in Traynor, 2002), the authoritative and intrinsic strategies appear to be pedagogically sound, especially for the maintenance of a student's emotional well-being. In an observation of two middle school classrooms, it was found that a teacher using coercive and task-oriented strategies had trouble maintaining discipline in his classroom. Another teacher used the authoritative strategy to help him in maintaining discipline in his classroom; he issued only 5 of the school's 165 referrals during the first 2 months of the school.

Phelan, Davidson, and Cao (1992) and Shimahara and Sakai (1995) have reported that educational researchers have recognized that the strong relationships between teacher and students lead to better classroom management (cited in Pigford, 2001). Pigford

(2001) made use of more positive statements than negative statements, engaged the students in personal conversations, and made the students realize that he truly cared about them as individuals. He further states that, after he built a very special relationship with a student, she never misbehaved again.

According to Thompson and Austin (2003), there has been growing concern over the relationship between the media, and rising violence and other antisocial behaviors among youth. Clark et al. (1978), Levine and Levine (1996), and Sharman (1979) suggested that, naturally, parents' failure to provide guidelines for television viewing has a lot to do with the attitudes and values of today's children (cited in Thompson & Austin, 2003). Another study, conducted by Anderson, Huston, Schmidt, Linebarger, and Wright (2001), showed that preschoolers, male subjects in particular, who had an opportunity to view educational television behaved less aggressively as adolescents (cited in Thompson & Austin, 2003).

Negative impacts of violence on television might include the promotion of increased violence, disrespect for adults, and the stereotyping of low-status minorities (Thompson & Austin, 2003). Herrington & Emmans (2002) discovered that the mass media occupy a prominent place in the lives of children. The typical elementary school child spends 30 hours per week watching television. Likona (1991), cited in Herrington & Emmans (2002), said that, by age 16, the average child would have witnessed an estimated 200,000 acts of violence on television. Research indicates that aggressive habits are often learned early in life. Once established, they are resistant to change. When a child observes media violence, it can have harmful, lifelong consequences. According to Kolata (2002), a study by Dr. Jeffry Johnson indicated that adolescents who watched

television more than 7 hours per week were more likely to commit an aggressive act when they were older (cited in Herrington & Emmans, 2002).

Eitle (2006) noted that being raised in a single-parent family is a risk factor for delinquency, particularly if the family is impoverished. Downey (1994), cited in Eitle (2006), reported that the benefits of living with fathers (economic and discipline practices) were offset by the relative lack of interpersonal resources among fathers. Living with either a single father or a single mother did not make any difference to the children. The research of Demuth and Brown (2004), Hoffman and Johnson (1998), and Hoffman (2002) had led to the conclusion that living with a single father increases the risk of delinquent behavior and substance use among adolescents (cited in Eitle, 2006).

Data Collection and Results

The research was conducted in a high school and a middle school setting. At high school, the students, who stayed at in-school suspension (ISS) for 3 days or more in the previous semester, were chosen for the study. Twenty-one survey parental consent and student assent were passed to the students. Four students and their parent/guardian showed their willingness to participate in the study by returning the parental consent and student assent forms. Only one student brought back the parent's/guardian's and student's survey forms (see Appendices A and B).

Due to the lack of sufficient data, the research was conducted in the middle school setting, too. At the middle school, the eighth-grade students, who stayed at ISS for at least three times in the current school year, were chosen for the study. Sixty-five consent, assent, and survey forms were given to the students, after a few modifications in the student's survey form (see appendix C). Only four students returned the

parent's/guardian's survey forms. One student brought back only the student's survey form. A total of five parent's/guardian's survey forms and six student's survey forms were received from both the schools.

Parent's/Guardian's Survey Results

The following results were obtained from the parent's/guardian's survey:

The family income ranges from below \$20,000 to \$30,000-\$40,000. So the children belong to low socioeconomic status to middle socioeconomic status households. The subjects are not much influenced by peer pressure. The subjects' behavior changes significantly in response to teachers' classroom management style and due to relationship with the teachers. The subjects spend zero to few hours in watching violent movies or watching fighting on a play station daily. All the subjects listen to the parent/guardian when he/she teaches him/her good values. All the subjects spend time with both parents/guardians daily.

Student's Survey Results

The family income information, combined with the number of members in the household, indicates that the subjects belong to low socioeconomic status to middle socioeconomic status households. Five of the participants are White and one of the participants is African American. Three subjects are male and three subjects are female. Their ages range from 13 to 15 years. Question numbers 5 to 11 in the student's survey are tabulated as follows: Strongly agree=1, Agree=2, Neutral=3, Disagree=4, Strongly disagree=5. Results are presented in Figure 1.

Student's Survey Results

Subject # 1	Q5.5	Q5.6	Q1.7	Q3.8	Q5.9	Q3.10	Q5.11

Subject # 2	3	2	3	3	4	5	3
Subject # 3	5	5	1	1	3	5	1
Subject # 4	3	3	3	2	4	3	2
Subject # 5	5	5	4	1	5	5	5
Subject # 6	5	5	3	4	5	5	5
Mean	4.3	4.2	2.5	2.3	4.3	4.3	3.5
Median	5	5	3	2.5	4.5	5	4
Mode	5	5	3	3	5	5	5

Figure 1. Student's survey results.

Conclusions and Recommendations

The researcher arrived at the following conclusions after reviewing information from the surveys. Socioeconomic status of the subjects is low to middle; low socioeconomic status is considered to be a leading factor of the students' bad behavior at the school. The subjects are not much affected by the peer pressure. Teachers' classroom management style is another important factor behind the students' bad behavior at school. Teachers' strong relationships with the students directly affects student behavior. The subjects spend zero to few hours in watching violent movies., but the violent movies are not affecting their behavior negatively, i.e., they are not learning violence from them. The parents of all the subjects teach them good values, including respect for teachers, and they listen to their parents most of the time. All the subjects are spending time with both parents on a daily basis, so they are not exposed to the problems associated with the single-parent household.

In essence, the main factors behind student poor behavior at school are low socioeconomic status, lack of effective teacher classroom-management styles, and strong relationship between student and teacher. I have retrieved the following consensus from the National Education Association's (NEA) Web site:

Managing a classroom has never been easy, but educators say the challenge these days seems bigger than ever. NEA's own recent survey asked the teachers what factors hindered them most in doing the best job they could. Nine percent blamed discipline issues or negative attitudes of the students. NEA skill-building program called "I Can Do It" has reached thousands of novice teachers in 22 states, which provides tips on managing student behavior. (2004, ¶ 22)

I would highly recommend including the importance of classroom management and the strong relationships between teachers and students in teacher professional development meetings. There is grant available for programs intended to prevent violence and the illegal use of drugs, and to promote safety and discipline in schools. Grants are available to provide counseling services and professional development programs for school personnel and character education programs. There are no online surveys, etc. available similar to the ones used for the research e.g., parent's/guardian's survey form and student's survey form. Therefore, no role could be assumed by the use of technology in this area.

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Appendix A

Parent's/Guardian's Survey

1. What is your family income (circle which applies)
 - a. Below \$20,000
 - b. \$20,000-\$30,000
 - c. \$30,000-\$40,000
 - d. \$40,000 and above
2. How much is your child influenced by his/her peers?
3. Do you normally hear complaints from a teacher, regarding his/her behavior, if the teacher is unable to motivate him/her?
4. Does his/her behavior change significantly in response to a teacher's classroom management style?
5. Does he/she always obey and respect the teachers who respect, like, and care for him/her?
6. How much time does he/she spend watching violent movies or watching fighting on a play station DAILY?
7. How often does he/she listen to you, when you try to teach him/her good values?
8. How much time does he/she spend with both parents/guardians DAILY?

THIS PROJECT HAS BEEN REVIEWED BY THE INSTITUTIONAL REVIEW
BOARD FOR THE PROTECTION OF HUMAN SUBJECTS AT THE UNIVERSITY
OF TENNESSEE AT CHATTANOOGA.

Appendix B
Student's Survey

- Answer all questions. Circle the best answer.
- For questions 5-11: 1=strongly agree, 2=agree, 3=neutral, 4=disagree, 5=strongly disagree

1. How many are the members in your household?
2. What is your ethnic background?
a. Caucasian b. Asian c. African American d. Hispanic e. Other
3. What is your gender?
4. What is your age?
5. If I won't join my friends in smoking, they will not talk to me.
1 2 3 4 5
6. I am always thrilled to give a hard time to teachers who don't motivate me.
1 2 3 4 5
7. I never give a hard time to a teacher who knows how to deal with me.
1 2 3 4 5
8. I always obey and respect the teachers who respect me, care for me, and like me.
1 2 3 4 5
9. I learned how to fight from violent movies and play station games.
1 2 3 4 5
10. It is OK to curse at, argue with, and disobey teachers, because nobody has ever told me to respect my teachers.
1 2 3 4 5
11. I would have been a different person if I had been living with both parents/guardians.

1 2 3 4 5
THIS PROJECT HAS BEEN REVIEWED BY THE INSTITUTIONAL REVIEW
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OF TENNESSEE AT CHATTANOOGA.

Appendix C

Student's Survey

- Answer all questions. Circle the best answer.
- For questions 5-11: 1=strongly agree, 2=agree, 3=neutral, 4=disagree, 5=strongly disagree

1. How many are the members in your household?

2. What is your ethnic background?
a. Caucasian b. Asian c. African American d. Hispanic e. Other

3. What is your gender?

4. What is your age?

5. If I don't follow my friends, they will not talk to me.
1 2 3 4 5

6. I am always thrilled to give a hard time to teachers who don't motivate me.

1 2 3 4 5

7. I never give a hard time to a teacher who knows how to deal with me.
1 2 3 4 5

8. I always obey and respect the teachers who respect me, care for me, and like me.

1 2 3 4 5

9. I learned how to fight from violent movies and play station games.
1 2 3 4 5

10. It is OK to curse at, argue with, and disobey teachers, because nobody has ever

told me to respect my teachers.

1 2 3 4 5

11. I would have been a different person if I had been living with both

parents/guardians.

1 2 3 4 5
THIS PROJECT HAS BEEN REVIEWED BY THE INSTITUTIONAL REVIEW
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Multiple Intelligences Responding Positively to a Writing Curriculum with Integrated
Technology

Esther Clark

Education 590, Spring 2007

The University of Tennessee at Chattanooga

*The Institutional Review Board of The University of Tennessee at Chattanooga
(FWA00004149) has approved this research project 07-041.*

Introduction

The purpose of this study is to examine the positive effects of a technology-integrated curriculum on ninth grade English students with multiple intelligences or different learning styles studying a unit on Homer's *Odyssey*. Since students all learn differently or have different learning strengths, my goal is to discover if the use of technology in the classroom could make a greater impact on the majority of students.

Review of Literature

A need for balance exists between traditional methods of teaching and methods that incorporate technology. If schools are going to incorporate technology into their curriculum, then three conditions are necessary to accomplish this goal. A transformation of the classroom environment, sufficient staff preparation, and a focused approach to the use of technology resources are necessary conditions. Attempting to link student achievement and the use of educational technology, if these three conditions are not met, is futile. Only then can educational technology have a positive impact on student achievement (Kozlowski, 2000).

Prairie-Hills Elementary School District gathered data from a 5-year study of technology implementation. The data revealed improvements in student achievement. Based on initial data, technology-rich classrooms showed positive student achievement results. Students in the integrated technology class outperformed students of the same grade level on the district's quarterly reading assessment. The students who were outperformed received a traditional educational approach, without technology in the classroom (Kozlowski, 2000).

In another study, one group of students was exposed to traditional methodology and the other group received traditional methodology that was supplemented with computer-assisted instruction. The result of this study showed that students receiving the supplemented instruction had higher achievement than those who received only traditional instruction (Christmann & Badgett, 1999).

There is evidence that students with visual learning styles learn better in a Web environment than do auditory learners. This insight into learning styles is a guiding factor in how some teachers are working to maximize the potential learning of students through appropriate technologies incorporated into their instruction (Meyer, 2003).

An interesting phenomenon is occurring with the new online generation. Research shows that the brains of this younger generation are functioning differently than their teachers' brains. Today's young people spend more time with technology and have developed the visual skills and rapid movement associated with working online. Many teachers, however, have spent more time shaping their minds through the linear and slow activity of reading (Meyer, 2003).

A study looking for critical thinking indicators used content analysis of online messages. Evidence from this study, and a variety of other resources, show that working online improves writing skills as students must write more, and more often. When their work is on display for their peers to view, it motivates them to think more critically about presenting themselves in writing (Meyer, 2003). Students are more likely to examine their ideas and the ideas of others when grouped in a collaborative effort (Crawford, 2000).

Technology in the classroom cannot be approached with the traditional, teacher-centered approach (Crawford, 2000; Stammen & Schmidt, 2001). Students' attention would be hard to maintain. The attempt to make all students learn at the same, rigid, methodical pace would stifle some learners' ability to create their own meanings, concepts, and knowledge interpretation. They would not have ownership of their learning experience. "Learning is most effective where learners are proactive in and control the construction of their own explanations." When educational technology is used in the classroom, it allows students to be proactive as individuals in their own learning (Crawford, 2000).

Good pedagogical practice is the key to making educational technologies work in the classroom. It gives a teacher the opportunity to try a different approach to teaching and learning. However, the teacher who decides to use technology in the classroom must take into consideration the students they are teaching, how they want to design their instruction, and the learners' needs. Technology is not the catalyst for change in the classroom. It is how the teacher approaches instruction with this tool to meet the learners' needs. Use of technology in the classroom creates a learner-based environment rather than an instructor-based environment. It allows students to individually engage with the curriculum being presented. The media is an enhancement to the learning process. Technology is not a replacement to a teacher's instruction (Stammen & Schmidt, 2001).

Data Collection and Results

Data was collected during the teaching of the unit on Homer's *Odyssey*. Students in an experimental group (one class selected randomly) were taught the subject matter in a technological manner. This means PowerPoint presentations and exercises which

required the use of computers to complete were used. Students in this grouping spent time in the computer lab completing unit requirements. The other three classes (control group) were taught the same material in a traditional manner. This means that the materials used were a white board, dry erase markers, handouts, pencils, scissors, markers, and paper to teach and complete exercises.

Students in all groups were monitored for peak interest and response to the material using an observation rubric (see Appendix E). Their reactions were monitored and recorded on this rubric. Students were assessed in the same ways, using the same methods. Assessment tools included journals (see Appendix A), a tour guide and presentation (see Appendix D), a final paper (see Appendix C) and other written assignments (Appendix B). Scores from these assessments were compared. Responses were examined and correlated, then original documentation was returned to the students or destroyed.

The tools for assessment, found in Appendices A, B, C, and D, were all important measurements that were taken into account when using the observations rubric (see Appendix E). As students completed their assignments, observation rubrics were used to measure and evaluate how students worked together to complete individual and team tasks. Results of student observations are presented in Figure 1.

Conclusions and Recommendations

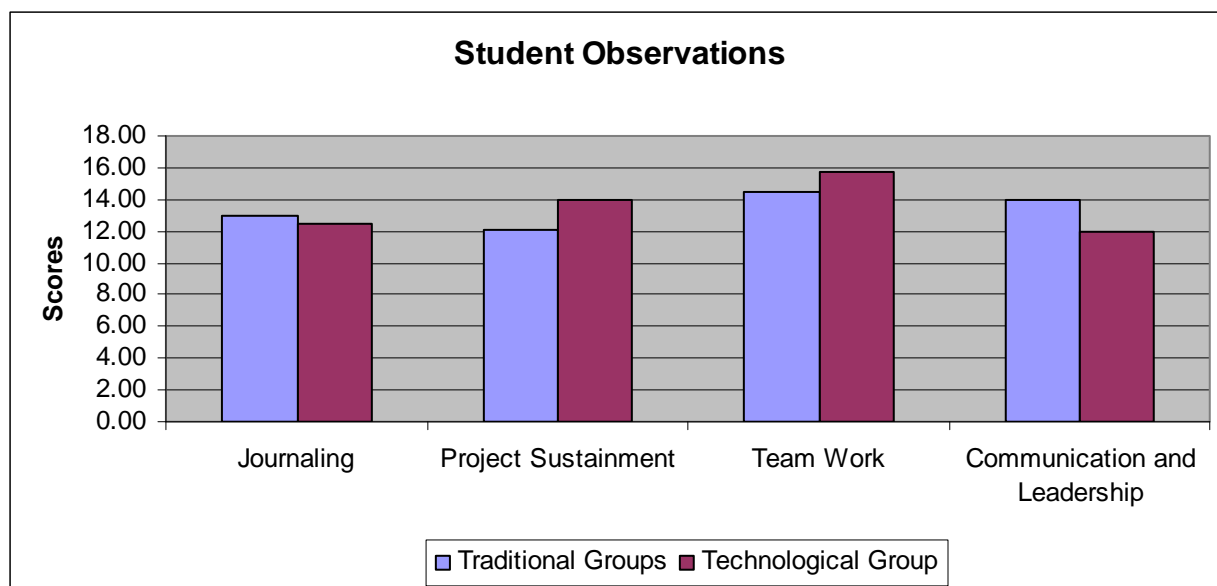


Figure 1. Results of student observations

As a result of this study, more student interest was sustained during project sustainment and team work than during journaling and communication and leadership. This may be due to the types of activities involved. Activities that involved use of the computer sometimes hindered students working together in a collaborative effort. The team work of the group worked well together as a coordinated whole, however, the effectiveness of the project leader was sometimes lacking. This may be due to different conceptual ideas within the group. Many of the traditional groups made a greater impact in communication and leadership due to the manual materials. When differences arose in the traditional groups, pictures or concepts were easily drawn or expressed with their available materials.

More time could be contributed to the enrichment and improvement of this study.

An evaluation could be made as to whether these differences are due to the types of

learners in each study group or whether the results were due to the teaching strategies. It would be helpful for the teacher to continue working with new strategies. Improving approaches to the learning differences of multiple intelligences could also have an impact on students retaining content knowledge.

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Appendix A

Journal Examples:

- Describe a fantastic journey you would like to take. Where would you go? What would your adventures be? How do you think taking this journey would change your life?
- Define what the term hero means to you.
- What are your strengths and weaknesses? Describe them for me.
- What kind of obstacles do you think people today have to overcome?
- Predict why this piece of literature is still relevant today.

Appendix B

Exit Slips: Students will fill out exit slips throughout the class in order to provide insights into their experiences.

What did you like about this assignment?

What would you like to have as an assignment?

What could I do differently to make this assignment interesting to you?

Interviews: I will invite students to meet with me to further discuss their experiences throughout the class. We can talk about their responses to the exit slips.

Artifacts: A number of activities will be assigned to practice creative writing throughout the class. Students will write a research paper with the rubric provided. They will read a part of the text, write a summary as a group, provide questions for their exam and illustrate their portion of the text. Students will write personal ads to share with classmates that go along with the text. A culminating activity will be a tour brochure and presentation through multimedia. Any work that is available for displayed will be placed on walls of the hall and classroom for the entire school to appreciate.

Appendix C

Final Paper Scoring Rubric

Criteria	Successfully Accomplished	Mostly Accomplished	Partially Accomplished	Insufficiently Accomplished
Grammar, spelling, and other mechanics employed correctly.	25	20	15	10
Research is thorough.				
Student exhibits that he/she is familiar with the text.				
Student has successfully combined research with examples from the text.				

1. You may choose your own topic from the research topics listed on the board.
2. Papers must be five to seven paragraphs.
3. Use a minimum of three sources.
4. Papers will be worth 100 points.

Appendix D

Tour Guide Rubric

Presentation

1. Did all group members participate in the presentation?

15 10 5 0

2. Did the presentation stay within the time limit?

5 (yes) 0 (no)

3. Was the presentation clear, concise, and understandable?

15 10 5 0

4. Would I go on your tour? Was the presentation persuasive and detailed?

15 10 5 0

Handout

5. Were relevant parts of Ithaca and Part II covered?

15 10 5 0

6. Was the handout pleasing to the eye? Were pictures included?

15 10 5 0

7. Were four different attractions featured?

15 10 5 0

8. Were they described thoroughly and with good detail?

15 10 5 0

9. Was the handout free of spelling, punctuation, and grammar errors?

15 10 5 0

Total /125

Appendix E

Student Observation Sheet and Rubric

[illegible]

Student Observation Rubric				
Attributes	Above Standard	At Standard	Attribute Still A Goal	Attribute Points Earned
Points Possible	(5-4.5)	(4.0-3.5)	(3.0-0)	
Use of Class Time	Came to class prepared and equipped; made effective use of time; were always on task and actively involved in the project.	Usually came to class prepared and equipped; usually made effective use of time; were usually on task and actively involved in the project.	Came to class unprepared a majority of the time, not using time effectively or staying on task.	/5
Journal	Kept up-to-date and organized, and labeled Organization and reflection are evident.	Kept up-to-date, organized	Journal is incomplete or missing.	/5
Project Sustainment	Sustained the project with virtually no intervention from teacher; utilized problem-solving skills to implement the technology.	Sustained the project with some intervention from teacher; utilized problem-solving skills to implement the technology.	Project was not sustained or was sustained with considerable help from the teacher.	/5
Team Work	Consistently worked together as a well-coordinated team; divided large task into a number of smaller tasks; smaller tasks were assigned to team members; team members pulled their own share.	Usually worked together as a well-coordinated team; usually divided large task into a number of smaller tasks; smaller tasks were usually assigned to team members; team members pulled their own share.	Team did not work together and effectively split up tasks. Outside intervention was needed to help split up work; team members did not pull their own share.	/5
Communication and Leadership	Project leader was assigned; effectiveness of his/her role was clearly evident by the level of communication and coordination with each other and the teacher.	Project leader was assigned; effectiveness of his/her role was usually evident by the level of communication and coordination with each other and the teacher.	Project leader was not assigned or was not effective as evidenced by the lack of communication and coordination.	/5
Observation Point Total				/25

Using Technology in Instruction: Internet Web Sites

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Education 590, Spring 2007

The University of Tennessee at Chattanooga

*The Institutional Review Board of The University of Tennessee at Chattanooga
(FWA00004149) has approved this research project 07-029.*

Introduction to the Problem

The problem is that it can be difficult to keep students engaged for 1 hour and 20 minutes every class period without varying instructional methods, and including more exciting and engaging activities. Because I have noted that my students seem to be more interested in lessons in which I use computer technology, especially the Internet, I have decided to study the benefits of this method. I have previously used this particular Web site, and students often stay engaged for the entire 20 minutes. Perhaps it is because they are on a timer, and they do not want to waste time. Perhaps it is because they know they will be held accountable for their results when they send them to me through e-mail. For whatever reason, it seems to work well, and I want to test that theory.

Review of Literature

Many teachers are trying to incorporate technology in their classrooms. However, in the past, research did not support the effectiveness of its use in actually bettering students' learning. The articles I have read suggest that some factors, including curricular alignment, adequate resources and planning, and the characteristics of student populations (propensity toward use of computers at home, demographics, etc.) affect the outcomes. More recently, teachers have seen some improvement in student learning with the use of technology (Krentler & Willis-Flurry, 2005, p. 316).

Still many of the authors remain skeptical of the usefulness of technology in classrooms. They have questioned the benefits of technology: whether it is being wrongly equated with progress and whether student interest is falsely being perceived as enhanced learning. In emphasizing the fact that even the U.S. Department of Education has not found conclusive evidence that technology increases learning, they have stated the obvious: "The adoption of technology alone is not directly impacting learning in schools.

The technology must be understood and utilized appropriately for this to occur”

(Stellwagen, 1999, p. 3-9).

Students often appear to be more excited about, and interested in, using computers and technology to learn, than not using them. One reason for this is that students can often learn at their own pace using computers. I have seen that same advantage with my students, especially while using the Conjuquemos Web site (Yegros, 2007). Also, using computers in instruction can help make the learning more student-centered, rather than teacher-centered. It fosters creativity, which one article says, can lead to more engagement and enhanced learning (Goddard, 2002, p. 19). The question still remains if the student will really learn more this way, or if they will simply be more entertained. Overall, the jury is still out on this one. That is one reason I chose this project.

Teachers need support to implement the technologies they learn in teacher colleges. Their resources are limited. There is not enough support, in terms of personnel to train them and government or system-sponsored sites that link to peer-reviewed, online activities and software companies, and not enough money for updated software and hardware. Teachers need to know which sites are of high quality, and are relevant to their state standards and benchmarks (Morris, 2002, p. 3). Teachers need a computer for every student, and class sizes continue to grow. Teachers need time to plan these time-consuming lessons. Yet, there is less time because there is more work to grade. Even schools with state-of-the-art computer labs often do not have enough class periods open for many teachers to use the computers on a regular basis.

In my research, I found a potential answer to one of the above problems, a public broadcasting site from NY that links to peer-reviewed sites and lessons. "wNetSchool" contains references and links to educational sites across the curriculum. "Thirteen

regularly highlights special sites, programs and activities, and informs educators about these resources through an online communication, the wNetSchool Bulletin” (Donlevy& Donlevy, 1999, p.141-143).

Strategies for integration of technology are sometimes limited in scope. Teachers sometimes do not know where to start with all the Web sites that are available, or they just do not know which sites and software programs would best fit the needs of their students and their curriculum. There was an emphasis on teachers being creative in their applications of the technology. Teachers should propose uses for technology, rather than allowing technology, itself, to drive educational needs (Goddard, 2002, p. 22). Using the Internet for instruction is a favorite method of teachers, increasingly as student ages increase. Kindergarteners may have trouble typing on a keyboard, but older students are more apt to enjoy researching and learning online (Morris, 2002, p. 6-7). Teachers often enjoy the opportunity to sit and talk with other teachers in their same subject area, who have already been using new technologies in their lessons.

Perhaps the following could be seen as an example of allowing the technology to drive our educational needs because some teachers are using video games to teach, based on observations that kids love video games. However, the video games have been modified significantly and aligned with state curriculum standards. Also, the basis of this idea was based on more than children’s hobbies. It was based on the work of Vygotsky, regarding children at play. The study using the Quest Atlantis project was much more entertaining than the Web resources I have found, but it showed me where my research could eventually take me. “Students participating in QA offered character insights that were either deeper or better supported than did students in equivalent conditions.” Additionally, these students showed significant learning in science and social studies.

Another outcome of integrating Internet games into instruction can be to inspire, rather than coerce, students to learn. There is an entertainment factor involved. “Digital multimedia provide a resource for children to develop a sense of autonomy and an awareness of consequentiality” (Barab & Thomas, 2005, p. 86-87).

Many of the studies utilized pre-tests and post-tests to chart student progress after using technology in the classroom. However, because students are often different, the only comparisons that could be made were between the teacher and the overall change in each student’s own performance. For this reason, I do not intend to compare one class to another, so much as to itself. The results sometimes were encouraging for me. One author noted, “A shift toward student-directed integration occurs at this stage to produce improvements in learning that allow students to master higher-order thinking skills, complex concepts, and skills they may not have otherwise encountered without technology” (Goddard, 2002, p. 21-22).

The goals of the No Child Left Behind Act include the Title II D: Enhancing Education Through Technology (EETT) program. Perhaps this is why studies show that more and more teachers have identified an interest in, and the need for, using technology more effectively in the classroom. I did not realize, before now, that any possible implementation of technology in classrooms at my school, as a result of my experiment, would require substantial staff development and training (McIntire & Rigeman, 2005, p. 31-32).

Overall, many of the articles I read did not focus on using Internet Web sites in instruction, as I plan to do. However, I was able to glean helpful information from them, and focus on the parts of the articles that did deal with Internet use in lessons. Using software programs to aide in instruction has much the same effect as using the Internet. In

fact, many Web sites do the same things as packaged programs do.

Several of these articles dealt with using technology in instruction for the sake of teaching the technology, not a subject matter. I believe that, while this is not a main goal of my research, it will be one of the outcomes. My students will learn how to maneuver their way through the Internet to the Web site, create an account, look up answers, e-mail results, etc. This is important for their education because computer literacy has become as important as language literacy in the job market. Computer literacy is an important part of making our students informed citizens in this great democracy. It empowers them to do research, connect to the world, communicate, and remain competitive.

Data Collection and Results

Values

The school believes that all students can learn. I am committed to protecting students from injustices and adverse effects that may result from this study, including bias and neglect. I will require a signed, informed consent letter from both parents and students. Students will not have to participate. They can opt out at any time. For the sake of fairness, each group will get a chance to be the control group.

The Problem

The intervention of applying technology (including a reference chart) to the conjugation of verbs will likely have the outcome of making this rather boring activity less painful and more engaging for students. My goal is to “trick” students into learning more than they normally would, and work harder than they normally would. This will give them an unlimited amount of problems in a 20- minute time frame, allowing them to work at their own pace, and perhaps do more than they would with a limited number of problems.

The essential problem is a question: Will using computer (Internet) technology in instruction increase the learning of Spanish? The specific research questions are:

1. Does using computer technology in the classroom encourage students to be engaged in learning?
2. Does using computer technology in the classroom result in learning more than using worksheet covering the same material in much the same way?
3. Will they enjoy the learning more (survey)?
4. Will it be difficult for my students or me to understand and apply this technology to learning and teaching Spanish?

Method

I will use a treatment-control group contrast to compare traditional and contemporary, technological teaching methods. The students involved will be chosen randomly. First, I will teach students in two classes, the preterit tense using the same lesson. Then, I will give them the same initial test. I will compare the re-test scores to the pre-test scores in 2 days. Intervention will be as follows.

1. The day after the initial test: Class A will go to the computer lab to conjugate verbs in the preterit tense for 20 minutes using the tenth link (preterit: all verbs) on the following Web site: <http://www.conjuguemos.com>. Class B will not go to the lab. They will conjugate the same verbs in the preterit using a long worksheet. They can use the verb chart on the board as a reference. I will collect it, finished or unfinished, after 20 minutes. On the following day, I will re-test both classes. I will repeat this procedure the next week using the imperfect tense (another form of the past tense in Spanish). First, I will teach students in two classes, the imperfect tense using the same lesson. Then, I will give them the same initial test. I will compare the averages of these scores.

2. The day after the initial test: Class A will not go to the lab. They will

conjugate the same verbs in the imperfect using a long worksheet. I will collect it, finished or unfinished, after 20 minutes. To be fair, there will be a general verb chart on the board for their reference. Class B will go to the computer lab to conjugate verbs in the imperfect tense for 20 minutes using the following Web site:

<http://www.conjuguemos.com>. On the following day, I will re-test both classes.

Subjects

This will take place in two Spanish II classes. The school is an urban magnet school, with about 550 students, half of which are zoned. We have an ethnic makeup of approximately 80% African American, 14% White, 3% Native American, 2% Hispanic, and 1% Asian. Almost 90% of our students receive free and reduced-cost lunches. The students have relatively low overall performances on mandated tests. Thus, the school is listed by the state as a school that needs improvement. The students in my classes are in grades 9-12, with about an equal ratio of males to females. Usually, in a class of 30-32 students, I have two gifted students, and four or five students with learning disabilities. I have a very small classroom with rows of desks. The computer lab is also rather small, with rows of tables. In both rooms, there is a loud echo, there are thin windows that let in a lot of heat, and there is a very loud window air conditioning unit. This will make the instruction more challenging. I was planning to use NetOp School, a program that would allow me to better control and observe what each student is doing on each computer (including sending them all a link to the site), but the program was just taken out of the lab, and the school does not plan to replace it. I will have to write the URL and directions on the chalk boards and rely more on walking around the room to observe and using the video camera on a tripod.

Other members of the community that will be affected by this study include parents and administrators, who will have to give permission for this study to occur, other teachers, who will benefit from hearing my results and resources, and the librarian, from whom I will borrow a digital video camera. I will e-mail the results to all of my fellow faculty members. I will also present the results in a meeting of my school's faculty and in another meeting with all the Spanish teachers from Hamilton County schools. I have posted links to such sites, and their access codes, on my school's Web site. Parents, other faculty, and students visit them from home or the office, sometimes encouraged by extra credit.

Expected Outcomes

I predict that students will find the computer interaction more engaging, and they will learn more about conjugating in the past tense, as a result. Thus, I suggest that they will retain more of this information in their long-term memory for the test. Their scores on the re-tests will likely be higher than the initial tests, to a greater degree than the increases I will see in their re-tests after remediation with worksheet instead of computers. In other words, class A will see a higher increase in scores the first week. In the second week, class B will see a higher increase than class A. This will show that computer remediation works better than worksheets in both classes, and for both tenses

Apparatus

I will be using the new computer lab, with 30 computers connected to the Internet. I will have a digital camcorder set up to record students' engagement. I will give a survey using a likert scale to poll students. I will use a multiple choice and short answer test and

Integrate Pro to crunch the numbers.

Procedure

Collection. The achievement tests will be identical to the re-tests, and will include true or false, short answer, matching, and multiple choice questions. I will also use structured observation and note participation of students in class during each activity. I will record the class for further review. Students will send results of their 20 minute activities to me by e-mail before logging off the computers. The Web site will provide information on who did the activity, how many verbs were conjugated in 20 minutes, and the percentage of correct conjugations. Students will also turn in worksheets to me (see figure 1).

Analysis. I will average the scores of the tests and compare them to the average re-test scores. I will base my research conclusions on a comparison of the gains between classes. I will compare the gains of the computer-remediated class with the gains of the worksheet-remediated class each week. I will also compare the total participation points lost for being off-task after reviewing the video, and the scores from the surveys. Finally, I will compare the gains from week two with the gains from week one in the same class. In this way, each group will be compared to the other, as well as to itself. This is for the purpose of mitigating the effects a superior class could have on my study. These extra precautions, including the repetition of the trial during the second week, are intended to increase the reliability and validity of my data. I will grade and compare the scores on the worksheets and the percentage grades on the Internet activities. Appendices A through G contain the instruments and other information.

Results

In order to collect data, I gave a pre-test over both of the past tenses in Spanish. I gave the students these same test questions after remediation activities, but as two separate tests. I collected data on participation to determine whether students were actively engaged by recording participation points in my grade book during both remediation procedures, and by video recording the remediation procedure in the library computer lab. Finally, I surveyed students to find out which remediation activity they enjoyed more, and which one helped them learn more. I entered the test scores into a grading program called Integrate, which calculated averages and standard deviations for me.

Class A

Of the 20 students tested, the class average on the first practice (pre-test) was 59%, with a standard deviation of 28%. After throwing out the scores of the eight students who did not take the re-test, the results showed that, of the 13 students tested, the class average on the first practice (pre-test) was 44%, with a standard deviation of 24%.

Of the 13 students, the class average on the imperfect re-test was 58%, with a standard deviation of 31%. This was an increase of 14 percentage points with worksheet remediation. Of the 12 students, the class average on the preterit re-test was 38% with a standard deviation of 21%. This was a decrease of 6 percentage points with online remediation.

Class B

Of the 19 students tested, the class average on the first practice (pre-test) was 56%, with a standard deviation of 25%. After throwing out the scores of the eight

students who did not take the re-test, the results showed that, of the 11 students tested, the class average on the first practice (pre-test) was 57%, with a standard deviation of 25%.

Of the 11 students tested, the class average on the imperfect re-test was 73%, with a standard deviation of 31%. This was an increase of 16 percentage points due to the online remediation. Of the 11 students, the class average on the preterit re-test was 53%, with a standard deviation of 30%. This was a decrease of 3 percentage points due to the worksheet remediation.

Problems and Circumstances

There are several notes to be made about circumstances affecting these results. Since there was a video camera on during parts of the computer lab instruction, but not during the worksheet instruction, students may have been encouraged to work harder during the lab time. Technical problems in the lab caused the class to be split into three rooms, because there were not enough working computers in the one room. This may have countered the motivational effects of having the camera on, since students had more freedom to be off-task when the teacher was in another room.

Furthermore, there was one student in class B who did not take the pre-test, but took the re-test. Her score was thrown out for that reason. Another student, known for cheating, scored a 76% on the pre-test, and a 25% combined on the re-test. This looked like he must have cheated during the pre-test, so his scores were thrown out. A third student, with ADD, seemed to give up and guess on the second half of the re-test, the preterit tense. His score was dropped from the preterit scores. During the day of the re-test, several students were pulled out of both classes for Gateway testing in other courses

and for discipline issues (e.g., suspension). This caused the number of students re-tested to be lower, so their scores were thrown out, too.

Conclusions and Recommendations

In summary, only in class B did the online remediation bring better gains. This gain was two points better than the best result for the worksheet remediation (a 14-point gain). However, since the worst result for the worksheet remediation was three points better than the worst result for the online remediation, results are inconclusive. It appears that worksheet remediation works best for some students, while online remediation works best for others (see figure 2). This is the most important result of this research. It is possible that the pretest re-test scores for both classes were lower than the original pre-test scores because it was the last test, and students were growing tired of answering questions (see figure 3).

The surveys showed that students enjoyed the computerized remediation more than the worksheet remediation by a vote of 28 to 4. Some students did not answer this question. In both classes, the students answered the question, “Did you enjoy working on the computer lab more than working on the same material in the classroom?” with a total of 700 percent more “yes” answers than “no” answers. The survey also showed that students did not enjoy the worksheet. That question had the lowest score of all (see figure 4). The highest score of all showed that the students understood the computer activity more than the worksheet activity (see figure 5).

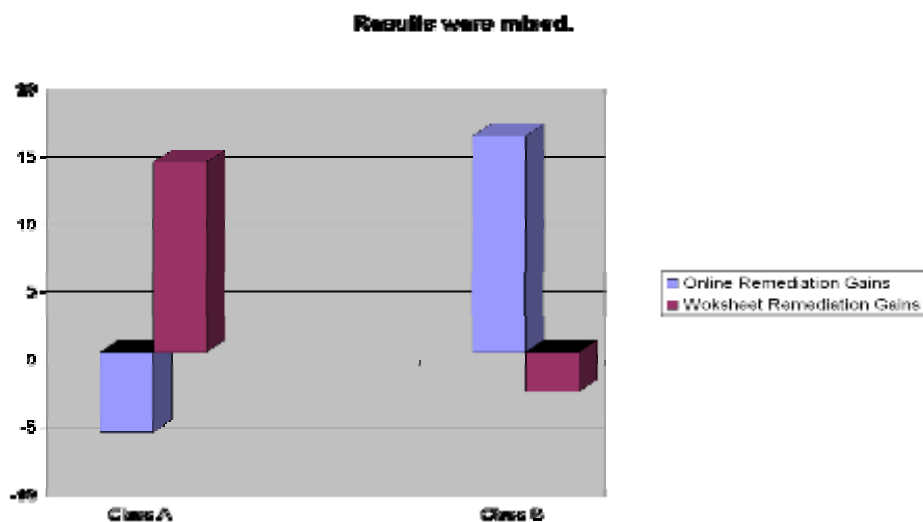


Figure 1. Results balanced each other.

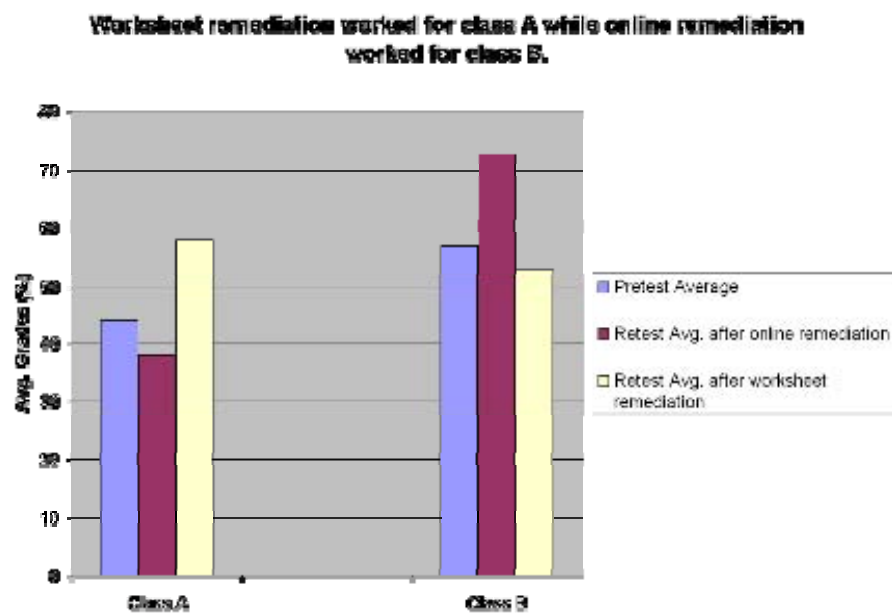


Figure 2. Worksheet remediation worked for class A while online remediation worked for class B.

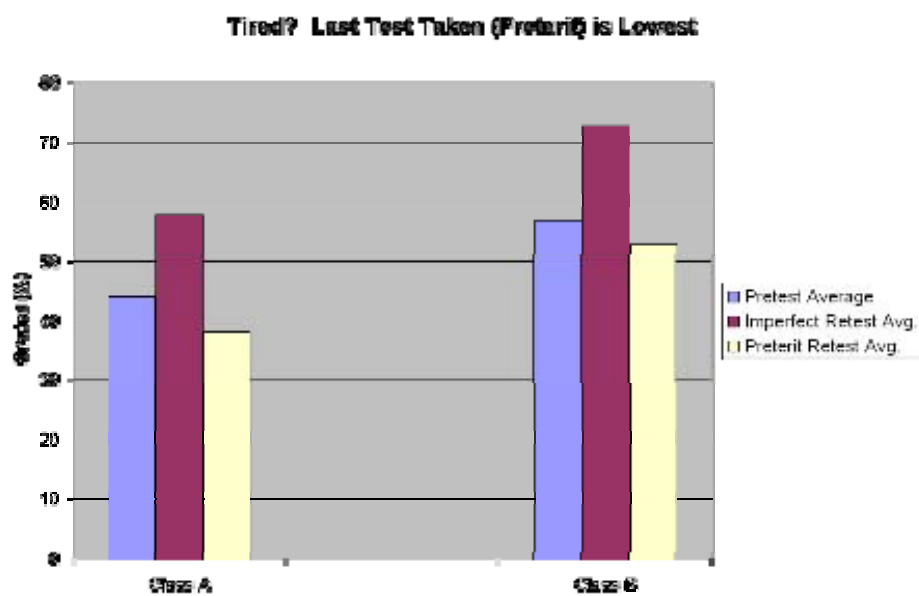


Figure 3. Patterns show students may have been tired of the testing.

<u>Survey Results:</u>	<u>Yes</u>	<u>No</u>
Do you enjoy working in the computer lab more than working on the same material in the classroom?	28	4
I was engaged in the worksheet activity.		
I was engaged in the computer activity.		
I liked the worksheet activity.		
I liked the computer activity.		
I understood the worksheet activity.		
I understood the computer activity.		
I feel that using computers helps me to learn better than doing worksheets.		
<u>Totals:</u>	<u>3.054</u>	<u>3.216</u>
	<u>2.8</u>	<u>3.3</u>
	<u>3.27</u>	<u>3.38</u>
	<u>3.054</u>	<u>405</u>

Figure 4. Survey Results. Students answered on a scale of one to four.

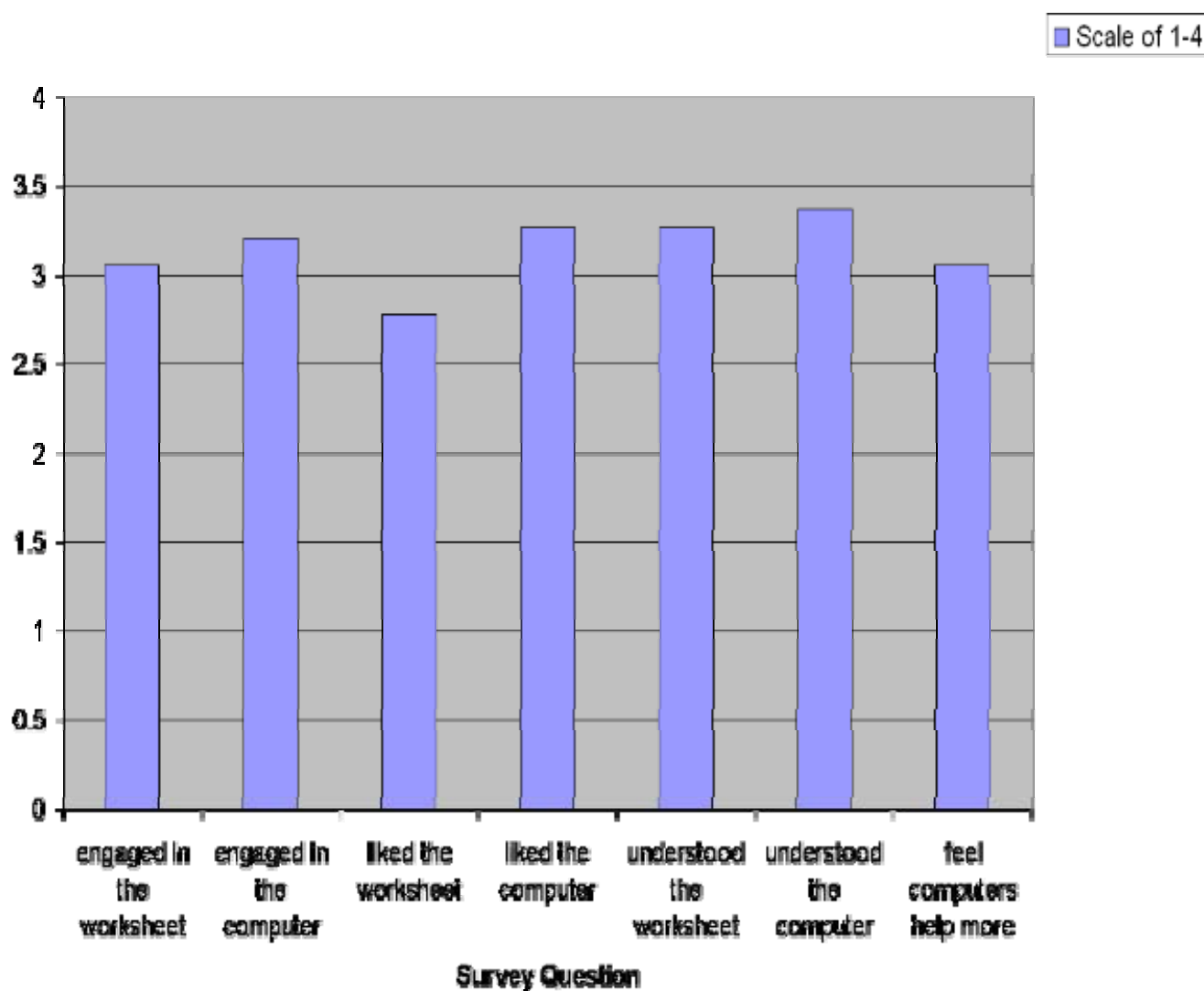


Figure 5. Graphic representation of the survey feedback

My recommendation for teacher professional development is to learn how to use online educational programs, because they do seem to work better for some types of students to learn new information. I suggest assessing your students' interests and learning styles to see which types of activities will help which students the most. Not all students learn in the same way, so we should not teach them all in the same way. Learn to use scaffolding. It seemed to help my students in both types of activities. Grant money is available to support further research in this area. Perhaps a larger study, with many more

students participating, or dividing the pre-test in two, giving a preterit and an imperfect pre-test, would bring more accurate results. Videorecording both remediation activities and having a fully-functional computer lab would also balance the results.

I will continue to use this and other Web sites in my lessons. I will also promote it among the faculty at my school. Also, I will adapt my method, try again, and, possibly, will stop using the Web for instruction with students who have certain types of intelligences.

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Appendix A

Sample worksheet for conjugating into the Preterit or Imperfect (control group)

Conjugate the following words:**NOMBRE:** _____**Ser- to be (Permanently)**

yo-	_____	nosotros-	_____
tú-	_____		_____
él- ella-	_____	ellos- ellas-	_____
usted-	_____	ustedes-	_____

Estar- to be (temporarily)

yo-	_____	nosotros-	_____
tú-	_____		_____
él- ella-	_____	ellos- ellas-	_____
usted-	_____	ustedes-	_____

Hablar- to talk

yo-	_____	nosotros-	_____
tú-	_____		_____
él- ella-	_____	ellos- ellas-	_____
usted-	_____	ustedes-	_____

Cantar- to sing

yo-	_____	nosotros-	_____
tú-	_____		_____
él- ella-	_____	ellos- ellas-	_____
usted-	_____	ustedes-	_____

Volver- to return

yo-	_____	nosotros-	_____
tú-	_____		_____
él- ella-	_____	ellos- ellas-	_____
usted-	_____	ustedes-	_____

Jugar- to play

yo-	_____	nosotros-	_____
tú-	_____		_____
él- ella-	_____	ellos- ellas-	_____
usted-	_____	ustedes-	_____

Pedir- to ask for

yo-	_____	nosotros-	_____
tú-	_____		_____
él- ella-	_____	ellos- ellas-	_____
usted-	_____	ustedes-	_____

Pensar- to think

yo-	_____	nosotros-	_____
tú-	_____		_____
él- ella-	_____	ellos- ellas-	_____
usted-	_____	ustedes-	_____

Comer- to eat

yo-	_____	nosotros-	_____
tú-	_____		_____
él- ella-	_____	ellos- ellas-	_____
usted-	_____	ustedes-	_____

Vivir- to live

yo-	_____	nosotros-	_____
tú-	_____		_____
él- ella-	_____	ellos- ellas-	_____
usted-	_____	ustedes-	_____

Salir- to leave

yo-	_____	nosotros-	_____
tú-	_____		_____
él- ella-	_____	ellos- ellas-	_____
usted-	_____	ustedes-	_____

Poner- to put

yo-	_____	nosotros-	_____
tú-	_____		_____
él- ella-	_____	ellos- ellas-	_____
usted-	_____	ustedes-	_____

Dar- to give

yo-	_____	nosotros-	_____
-----	-------	-----------	-------

Caminar- to walk

yo-	_____	nosotros-	_____
-----	-------	-----------	-------

tú-				tú-			
él- ella-	}	ellos- ellas-		él- ella-	}	ellos- ellas-	
usted-				ustedes-			

Appendix B

Sample of a student conjugating on the web site

Welcome, Jon Craig [Logout](#)

Quick Links

- [OPTIONS](#)
- [French](#)
- [German](#)
- [Latin](#)
- [Spanish](#)
- [FAQ](#)
- [Support](#)

Teacher Options >> Spanish Activities >> Verb Practice

PRETERIT TENSE: ALL VERBS

Pronoun:usted

Verb:traer

ANSWER:trajo

SCORE

FEATURES

CLOCK

19:33

[Stop clock](#)

Choose your verbs.

Choose your pronoun.

Choose your time.

Choose ALL VERBS or press Crtl (PCs) or Option/Apple (Macs) while you click to select multiple verbs.

ALL VERBS
andar
aprender
asistir
borrar
buscar
caber
cocinar
comer
comprender
correr

You can only make one selection from this list.

ALL PRONOUNS
ALL but vosotros
yo
tú
él
ella
usted
nosotros
vosotros
ellas
ellos
ustedes

Would you like to be timed?

YES ☒ NO ☐

Type the minutes below:

Press START when finished

Appendix C
Partial sample of a verb chart available during the activity

PRETERIT TENSE: ALL VERBS

hablar :	<i>to speak</i>
hablé	hablamos
hablaste	hablasteis
habló	hablaron

comprender :	<i>to understand</i>
comprendí	comprendimos
comprendiste	comprendisteis
comprendió	comprendieron

escribir :	<i>to write</i>
escribí	escribimos
escribiste	escribisteis
escribió	escribieron

vivir :	<i>to live</i>
viví	vivimos
viviste	vivisteis
vivió	vivieron

aprender :	<i>to learn</i>
aprendí	aprendimos
aprendiste	aprendisteis
aprendió	aprendieron

borrar :	<i>to erase</i>
borré	borramos
borraste	borrasteis
borró	borraron

montar :	<i>to ride</i>
monté	montamos
montaste	montasteis
montó	montaron

asistir :	<i>to attend</i>
asistí	asistimos
asististe	asististeis
asistió	asistieron

mirar :	<i>to watch</i>
miré	miramos
miraste	mirasteis
miró	miraron

llevar :	<i>to wear, to carry</i>
llevé	llevamos
llevaste	llevasteis
llevó	llevaron

correr :	<i>to run</i>
corrí	corrimos
corriste	corristeis
corrió	corrieron

comer :	<i>to eat</i>
comí	comimos
comiste	comisteis
comió	comieron

Appendix D

Timeline

	Week 1—Preterite			Week 2—Imperfect		
Day:	Wednesday	Thursday	Friday	Wednesday	Thursday	Friday
Class A	Test	Lab	Retest	Test	Worksheet	Retest
Class B	Test	Worksheet	Retest	Test	Lab	Retest

Appendix E

Sample of report the website sends to me

CONJUGUEMOS GRADE SHEET

Name: **John Doe**

Exercise: **PRESENT TENSE: ALL VERBS**

Grade: **100 % : 60/60**

Date: 2005-12-07

Time Taken: 20 : 00

Verbs selected: ALL VERBS

Pronouns selected: ALL but vosotros

Full conjugation/Verb Chart: 0 times(s)

Appendix F
SAMPLE OF THE ASSESSMENT DOCUMENT

Spanish 2**Past Tense Test**

Please do not write on this sheet! Use Scantron!!!

1	caminaba	A	We walked	26	éramos	A	They were
2	caminar	B	They walked	27	eran	B	You were (tú)
3	caminabas	C	You walked (tú)	28	era	C	I was
4	caminaban	D	to walk	29	eras	D	You saw (tú)
5	caminábamos	E	I/ he/ she walked	30	veías	E	We were
6	venía	A	We came	31	supo	A	He had
7	veníamos	B	Y'all came	32	puso	B	He made/ did
8	venían	C	to come	33	tuvo	C	He wanted
9	venías	D	I/ he/ she came	34	quiso	D	He found out (knew)
10	venir	E	You came (tú)	35	hizo	E	He put
11	se comportaban	A	We greeted	36	andé	A	We walked
12	saludábamos	B	You trusted (tú)	37	andaste	B	I walked
13	se despertaba	C	He woke up	38	andamos	C	She walked
14	despedirse	D	to say goodbye to	39	andaron	D	They walked
15	confiabas	E	They behaved	40	andó	E	You walked (tú)
16	salían	A	I lived	41	fuiste	A	We went
17	vivía	B	Y'all left	42	fueron	B	You went (tú)
18	teníamos	C	You went (tú)	43	fui	C	I went
19	hacías	D	We had	44	fue	D	Y'all went
20	ibas	E	You made/ did (tú)	45	fuimos	E	You went (usted)
21	nos acercábamos	A	You waited for (tú)	46	saliste	A	You left (tú)
22	deseaba	B	They/ Y'all ordered	47	salí	B	We left
23	esperabas	C	I desired	48	salieron	C	They left
24	temer	D	We approached	49	salimos	D	He left
25	mandaban	E	to fear	50	salió	E	I left

1 Preterite means...

USE BACK OF SCANTRON NOW!!!

a. Future tense b. Past over a long period c. Past at a point in time d. Dictionary form of verbs e. None of these

2 Which word means I swam?

a. nadabo b. nado c. nadé d. nadaba e. both C and D

3 Vivía means...

a. I lived b. You lived c. He lived d. Both A and B e. Both A and C

4 Ellos _____ en la biblioteca.

a. estudiaste b. estudiamos c. estudiaron d. estudié e. estudió

5 ¿Quién enseñó la clase?

a. El estudiante b. el maestro/ profesor c. la alumna d. la enfermera e. None of these

Appendix G

Sample Survey

Did you enjoy working in the computer lab more than working on the same material in the classroom?

Why or why not?

Rate yourself below as a 1 (not at all); 2 (somewhat); 3 (mostly); or 4 (very much).

I was engaged in the worksheet activity:	1	2	3	4
I was engaged in the computer activity:	1	2	3	4
I liked the worksheet activity:	1	2	3	4
I liked the computer activity:	1	2	3	4
I understood the worksheet activity:	1	2	3	4
I understood the computer activity:	1	2	3	4
I feel that using computers helps me to learn better than doing worksheets:	1	2	3	4

An Investigation Of Homogeneous Versus Heterogeneous Grouping In Cooperative
Learning Situations

Chara Davis

Education 590, Spring 2007

The University of Tennessee at Chattanooga

The Institutional Review Board of The University of Tennessee at Chattanooga
(FWA004149) has approved this research project 07-017.

Introduction to Problem

One method of learning teachers often use in the classroom is teaming. Friend and Cook (2007, p 60) describe teams as “a set of interdependent individuals with unique skills and perspectives who interact directly to achieve their mutual goal.” Teams can be formed in different ways to accommodate various goals and objectives; however, one consistent characteristic in schools is placing students in heterogeneous groups where the team consists of a variety of academic levels. However, it is not clear whether placing students in heterogeneous groups has an advantage over placing students in groups where the students have similar and/or equal academic abilities. The purpose of this exercise is to determine how the implementation of various teaming strategies affects student performance. In this study, the students will be divided into heterogeneous teams and homogeneous teams based on ability. Within the groups, they will use the "jigsaw" method of group work to complete assignments. The student's performance on the assignments will be used to determine the effect of the teaming experience.

Review of Literature

A team is described as “a set of interdependent individuals with unique skills and perspectives who interact directly to achieve their mutual goal” (Friend & Cook, 2007 p60). More specifically, a team where “students work in small groups to accomplish a common learning goal under the guidance of a teacher” is referred to as cooperative learning (Lin, 2006, ¶ 2). Johnson and Johnson (1999) and Johnson, Johnson and Smith (1998) say that cooperative learning has five basic elements. The elements are “positive interdependence, individual accountability, promotive interaction, appropriate use of social skills, and periodic processing of how to improve the effectiveness of the group”

(Johnson & Johnson 1999 ¶ 39). When these elements are properly implemented, the research has shown that “group collaboration in the classroom can increase learning and achievement, social skills, self-esteem, and attitudes toward classmates and school” (Slavin, 1990 as cited in Webb, Nemer & Zuniga 2002, ¶ 2). Placing students in teams or cooperative learning groups has many advantages. It helps to build a student’s communication skills, can help increase tolerance and the acceptance of diversity, promotes higher level reasoning, promotes increased generation of new ideas, promotes greater transfer of information from one situation to another, increases retention, builds teamwork skills, reduces stress, and “increased willingness to attempt challenging tasks” (Baker & Campbell, 2005 ¶ 30; Huss, 2006; Lin, 2006; Payne & Monk-Turner, 2006; Patrick, Bangel, & Jeon 2005; Kim 2004; Vaughn, 2002; Johnson & Johnson, 1999; Johnson, Johnson & Smith, 1998; Slavin, 1996). The cooperative learning experience also [gives] students the opportunity to review and learn information that they did not understand before the cooperative learning activity (Webb, 2002).

According to Lin (2006, ¶2), research has concluded that cooperative learning is the top ranked teaching model that “promotes greater higher-order thinking, problem solving, and achievement.” Students can remember 75-90% of materials when they learn it in cooperative learning situations (Lin, 2006). In a survey of college students after an experiment involving group work, Payne and Monk-Turner (2006) found that 90% of students favored group work and that 90% learned from their group members. Since 1924, 168 studies have been conducted that compare cooperative learning to competitive and individual learning. These studies have shown that cooperative learning yields higher academic achievement than individual and competitive learning (Johnson, Johnson &

Smith, 1998). Cooperative learning groups are also said to be particularly beneficial to low academic achieving students and students of color (Huss, 2006; Vaughn, 2002).

Cooperative learning groups appear to be successful for many reasons. Students become an instrumental part of the group when they feel their efforts will contribute to the success of the group (Baker & Campbell, 2005). Students are successful and learn in cooperative learning groups because “[they] learn by doing rather than listening” (Payne, Monk-Turner, & Smith 2006 ¶7) and because they are actively using the material and information (Zimbardo, Butler, Wolfe, 2003). Cooperative learning also strengthens students social interactions, it gives them the desire “to achieve, [to develop] more positive interpersonal relationships, and [have] greater psychological health than competitive or individualistic learning efforts” (Johnson, Johnson, & Holubec, 1994 as cited in Morgan, 2003, ¶5). Cooperative learning can teach students that “(a) that knowledge can be, or should be, shared with fellow students; (b) that differences in opinion can be rationally negotiated even under conditions of test pressures; and (c) that cooperative learning procedures can be enjoyable and productive” (Zimbardo et al., 2003, ¶54). These types of lessons enable students to learn how to work well with others. The interdependent relationships that develop within a group help to facilitate the group’s success. Everyone feels the goal of the group will be met if everyone achieves their individual goals (Vaughn, 2002; Morgan, 2004). Morgan (2004) says that group members should also be aware of the fact that a single group member can affect how and/or if the goal is achieved.

The cooperative learning experience is most effective when the participants work well together and they successfully achieve their goal. There are many characteristics to

successful teams. Some of these characteristics include open communication, effectively listening, open-mindedness, clear roles, an established leader, clearly defined tasks, teamwork where everyone works together and contributes, there are well developed attainable goals (Payne, Monk-Turner, 2006; Baker & Campbell, 2005), and a timeline (Payne & Monk-Turner, 2006). In a classroom, there are also many things a teacher can do to help insure the success of a group activity. The teacher should provide strong guidance (Payne & Monk-Turner, 2006; Baker & Campbell, 2005), model the desired behavior, provide immediate feedback, and reward desired behavior (Lin, 2006; Baker & Campbell, 2005). The teacher can also use checks and balances to monitor productivity, employ various problem solving strategies (Friend & Cook, 2007), lengthen the amount of time the group spends together, provide proper group behavior training, establish “ground rules” (Mitchell, Reilly, Bramwell, 2004) and allow group members rate each other (Lin, 2006). If the teacher monitors, provides rewards and allows the students to rate each other, it may reduce the effects of a slacker and keep students from getting a grade they do not deserve (Payne & Monk-Turner, 2006). Students that slack off can demotivate hard working students and give them a negative feeling about group work (Ashraf, 2004).

Many studies have been conducted that demonstrate the success of teaming. Robert Slavin has conducted extensive research on the implementation of cooperative learning models in schools. He has examined the effects schools becoming complete cooperative learning centers on their academic achievement. He has found many successful situations where lower performing schools were transformed because they converted to a cooperative learning format (Slavin, 1999 ¶ 22-23). Payne and Monk-

Turner (2006) conducted a study that examined how students felt about teams. In this study, they assigned students to groups, gave them an assignment, and then asked them how they felt about the assignment after the group project was completed. They found that 90% of the students had a favorable experience, 90% of the students learned from their group members, and 85% of the students felt they learned teaming skills that could be transcended into business. Baker and Campbell (2005) conducted a study in an advanced math class. Students were placed in groups in order to solve three proofs. They observed that the students who worked in groups, as opposed to working individually, were more successful because they had more access to knowledge, they felt pressured to succeed to keep the group from failing, and the various personalities helped alleviate the stress of the problems. For example a member often told jokes to help lessen the tension. Additionally, members often provided positive reinforcement and motivation. Kim (2004) observed how group work benefitted a class of piano students. Often, piano students are isolated by their studies and are not given the opportunity to socialize. However, teacher-developed group activities gave the students in this particular situation the opportunity to interact and strengthen social and communication skills (Kim, 2004). Miglietti (2002) observed the use of cooperative learning in an accounting class. Not only does the use of cooperative learning help prepare students for careers, such as accounting, that uses these models to complete tasks, but it also increases academic achievement. She suggests groups of no more than four students who worked together for the entire semester and have assigned tasks.

Placing students in groups to take tests is another way to use cooperative learning and group work. Morgan examined the benefits and nonbenefits of college students

completing exams using cooperative learning groups. She concluded that “The increased depth of understanding, the feelings of support, respect for other's contributions, and the clarification of information produced more students with a greater awareness of the material and more developed social skills to be contributing members of teams” (Morgan, 2004 ¶20).

The understanding of successful cooperative learning group models not only affects groups in grade school; it also affects groups in jobs and college. According to Payne, Monk-Turner, and Smith (2006 ¶ 1) “employers want college graduates that have developed teamwork skills.” Miglietti (2002) says that group work is commonly used in the workplace and employers want to hire people with these skills. Furthermore, these skills can be learned when students are placed in successful teams where the goals have been reached. Socialization and communication are examples of skills that students learn in groups that can help them transition into the business world (Payne et al., 2006). In a survey of college students, after a study involving group work, Payne and Monk-Turner (2006) found that 85% of college students admitted that doing group work would probably work on teams in future jobs.

Carol Lundberg explains why cooperative learning is especially important in science education. When students graduate from high school and enter college, many decide not to declare science majors because they assume it involves a lot of individual studies with a lot of competition that will lead to a similar career. However, this is not the case. Science majors and careers involve a lot of cooperative and collaborative efforts between scientists and people of other disciplines (Lundberg, 2003). The cooperative learning skills students learn in school will transcend into their college majors and

careers. Lundberg compared the academic success of a variety of students who could or could not participate in cooperative learning groups in science classes due to outside classroom activities. Lundberg found that students learned better when they frequently participated in cooperative learning groups and were able to receive information that was taught by peers. She proposed this was because the students were actively teaching, learning, and discussing the information with their peers.

There are many types of cooperative learning models. One particular model is called the “jigsaw.” This model requires the students to be broken into groups. These groups are called “home groups.” Each person in the home group is assigned a particular role. This role correlates with the “expert groups” the students will have to form later. After the roles are assigned, a person from each home group that has that role forms another group. This group is called the “expert group.” Within the expert group, the students learn and become experts about a certain topic. When the information is learned, the students in the expert groups go back to their home groups. Within the home groups, the students take turns teaching their group members about the information they learned in their expert groups (Lin, 2006).

This strategy was first used in 1971 by professor Aronson. This strategy has been successfully implemented around the United States. It is said to promote “less prejudice and negative stereotyping, [increase self confidence, joy for school and academic achievement]” (Aronson, 2007, ¶1). The jigsaw method is an effective cooperative learning model because the students are not already experts of the information. If there are already experts of the information in the group they might have a tendency to dominate the group. However, since everyone is learning the information for the first

time, there is little opportunity for peer domination (Cohen 1994 as cited in Webb et al., 2002). The model is also beneficial because the students learn from each other. Lundberg (2003) found that students who learned from each other and taught each other in groups had better academic achievement than students who worked independently. It is suggested that teachers place students in heterogeneous groups when they use the jigsaw model (Lin, 2006).

There is a lot of evidence that suggests that cooperative learning groups are highly beneficial. It includes many beneficial factors such as increased academic success and improved social skills (Slavin, 1990 as cited in Webb et al., 2002). However, some researchers question whether students should be placed in heterogeneous groups or homogeneous groups based on academic ability (Baker & Campbell, 2005; Anderson, 2005; Patrick et al., 2005, Webb et al., 2002; Mitchell, 2004). There is a lot of evidence that suggests that heterogeneous grouping is the best way to arrange students for cooperative learning. For example, the success of heterogeneous groups was observed in an advanced mathematics college class (Baker & Campbell, 2005). Baker and Campbell (2005) observed the ability of students to complete three math problems consisting of proofs. They said these groups were successful because the higher level students encouraged the group to keep working. They observed that, in a group of homogeneous students, where all of the students scored below average on the pretest, the students were not as successful. They believe this group was less successful because it did not have a strong knowledge foundation as a resource, whereas groups that had a heterogeneous mix of students had a variety of knowledge levels to access. This is the conclusion many researchers find when comparing homogeneous groups versus heterogeneous groups.

“Advocates of cooperative learning recommend that students be grouped heterogeneously by ability level” (Patrick et al., 2005 ¶ 23). Cooperative learning appears to be beneficial to all students involved in the groups. Especially groups that are heterogeneous. Heterogeneous groups allow students to strengthen communication skills, become aware of other cultures, learn to work with other cultures, increase motivation, and become prepared for adult interactions (Huss 2006; Mitchell et al; 2004).

“Heterogeneous groupings are recommended since they encourage the acceptance of diverse styles and points of view, promote achievement in mixed ability classes, and produce benefits in socio-emotional domains”(Mitchell et al., 2004, ¶4).

However there is concern that heterogeneous groups do not benefit all of the students (Webb et al., 2002). Research conducted by Baer (2003) in a college classroom concluded that students in homogeneous groups achieved higher than students in heterogeneous groups. This may be because the students who are on the same level with other members of the group may hold each other's interest better than students on different levels. Webb et al. (2002) concluded that higher performing students typically perform well in homogeneous groups. Higher performing students can perform well in heterogeneous groups if they are willing to help the other group members and have a good social dynamic with the group. But a higher-performing student's attitude and behavior can prevent them from being successful in a heterogeneous group. The student may have a greater desire to appear intelligent over achieving the group goals; this can lead to frustration and resentment on the part of lower-level students. Furthermore, higher-level students may tend to dominate the group work (Webb et al., 2002).

Webb et al. (2002) says that heterogeneous grouping probably mainly benefits lower-performing students. In fact, many are concerned that heterogeneous groups actually harm students that are above average or gifted. Some argue that, when gifted students or higher-level are placed in heterogeneous groups their learning can be stunted because they spend time helping others that are not on their academic level and they do not have the time or opportunity to work on learning and achieving above their present level (Patrick et al., 2005; Huss, 2006). Previous research has shown that gifted students often do not like cooperative learning. The gifted students feel “used” and feel like they are doing the teacher’s job because they are asked to help nongifted students (Huss 2006; Patrick et al., 2005). Research has also shown that gifted students prefer to work individually (Patrick et al., 2005). Additionally students who typically feel competent may feel less competent when asked to work with gifted students in heterogeneous groups (Huss, 2006).

When considering gifted students and cooperative learning, Patrick et al. (2005) say it is not whether gifted students should or should not participate in group work. It should be a question of the type of group work in which they participate. Another consideration teachers should make when forming groups is the desired outcome of the group work. Baer suggests using homogeneous groups for academic achievement and heterogeneous groups for social interactions. Anderson (2005) says the the way groups are formed should be based on the desired outcome the teacher expects from the students. He says if the teacher wants the students to develop unity and postive attitudes, then he or she should form groups that are homogeneous, cohesive, and independent. However, if the teacher wants to encourage high performance, then he/she should form homogeneous

groups that consists of members who act opportunitically and “grasp hypothesis-driven thinking” (Anderson, 2005).

Cooperative learning situations should be modified and varied in response to the abilities of the students (Patrick et al., 2005). He goes on to say teachers should use different types of cooperative learning activities to benefit all of the students. Huss (2006) recommends “round table,” using talking chips, and flexibility groups. Also, teachers should give gifted students the opportunity to work alone because they made individual time to make intellectual advancements (Huss, 2006). Cooperative learning activities that involve gifted students must have accountability, must not have tasks that require “low level skills” such as worksheets, and the teachers need to model, expect, and reward desired behavior. Additionally the teacher needs to constantly monitor the group work and process, and model how to speak appropriately in a group setting. In situations that are accelerated, teachers should give gifted students the option to be placed in homogeneous groups or allowed to work alone (Patrick et al., 2005). To keep gifted students from dominating in a heterogeneous group Cohen (1994 as cited in Webb, 2002) suggests assigning projects that require everyone to input information where no one is an expert of all of the information, and using tasks where there is not a clear-cut answer or set of procedures.

Cooperative learning has many benefits. However, a teacher must make many considerations when placing students into groups. For example, a teacher must decide if he or she will choose the groups or allow the students to choose the groups. For this consideration, Mitchell et al. (2004) suggest teachers choose the groups. When students choose their own groups, they tend to pick their friends, and lower-level students

question why they have to work with other lower-level students (Mitchell et al., 2004).

Whether to place students in homogeneous groups or heterogeneous groups is a concern of many teachers. There is evidence to suggest that homogeneous groups are better (Patrick et al., 2005; Webb et al., 2002, Baer 2003) and there is a lot of evidence to suggest that heterogeneous groups are better (Huss 2006; Mitchell et al., 2004). This study will compare the academic achievements of homogeneous and heterogeneous groups that use the jigsaw cooperative learning model.

Data Collection and Results

Data Collection

Methods

Two samples were studied for this experiment. The first sample had students placed in homogeneous groups and the second sample had students placed in heterogeneous groups. The groups were arranged by the researcher and a cooperating teacher, based on academic achievement. The students were given a test designed by the researcher to assess academic achievement and prior knowledge about the nonliving environment. In the homogeneous groups, the high-achieving students were placed with other high-achieving students. The same was done for average-achieving, and low-achieving students. The heterogeneous groups were comprised of high-achieving, low-achieving, and at least average-achieving students. Before the group assignments, the students were taught a lesson about the nonliving environment with direct instruction. After the lesson, the "jigsaw" method of cooperative learning was used to provide additional information to the students about the nonliving environment on the cycles of matter. The students had to work together in their groups to complete a poster about the

cycles of matter. After the jigsaw activity, the students were given a test to assess knowledge attainment on the nonliving environment.

Student Grouping

The purpose of this exercise was to compare the achievement of students placed in homogeneous groups to achievements of students that were placed in heterogeneous groups. Students in four different periods of a seventh grade life science class were either placed in homogeneous groups or heterogeneous groups to complete a jigsaw activity on the cycles of matter. The students in the first and second period classes were placed in heterogeneous groups. The students in the fourth and sixth period classes were placed in homogeneous groups. The decision to form heterogeneous groups or homogeneous groups was random.

Data

The grades from the pre-test varied for the four classes. The first period class had an average of 45.4%. The second period class had an average of 31.8%. The fourth period class had an average of 55.3%. The sixth period class had an average of 25.3%.

All of the periods received higher average scores on the post-test. First period, which had heterogeneous grouping had an average score of 76.7%. Second period, which had heterogeneous grouping, had an average score of 67.2%. Fourth period, which had homogeneous grouping, had an average score of 71.6%. Sixth period, which had homogeneous grouping, had an average score of 51%.

The average scores increased by different percentages. First period increased by 31.3%. Second period increased by 35.4%. Fourth period increased by 16.3%. Sixth period increased by 25.7%. See Figures 1 through 5.

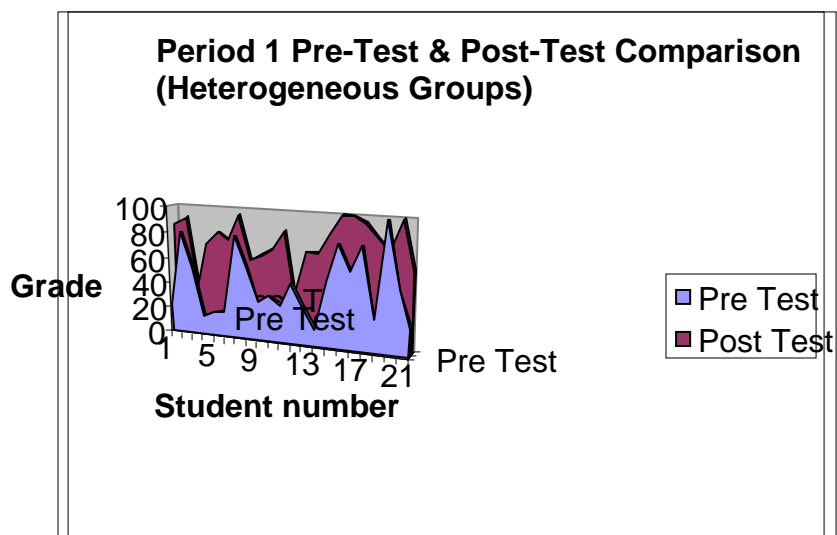


Figure 1. Period 1 pre-test and post-test comparison (heterogeneous groups)

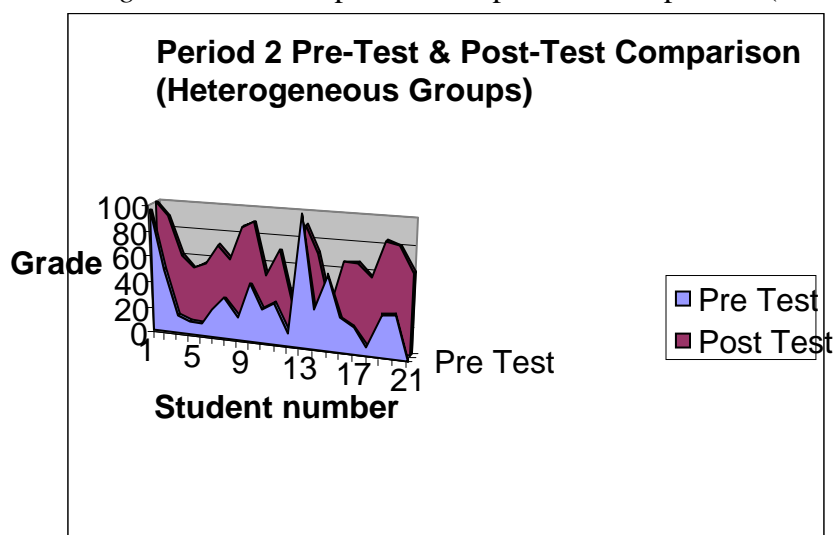


Figure 2. Period 2 pre-test and post-test comparison (heterogeneous groups)

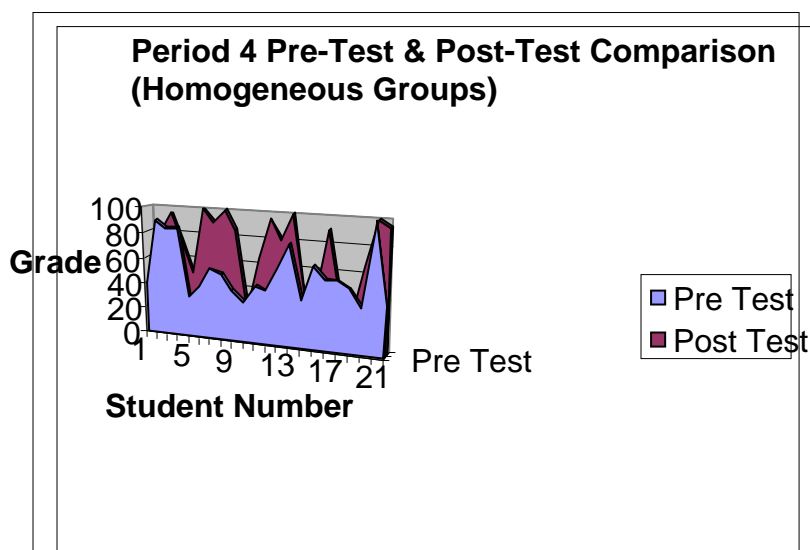


Figure 3. Period 4 pre-test and post-test comparison (homogeneous groups)

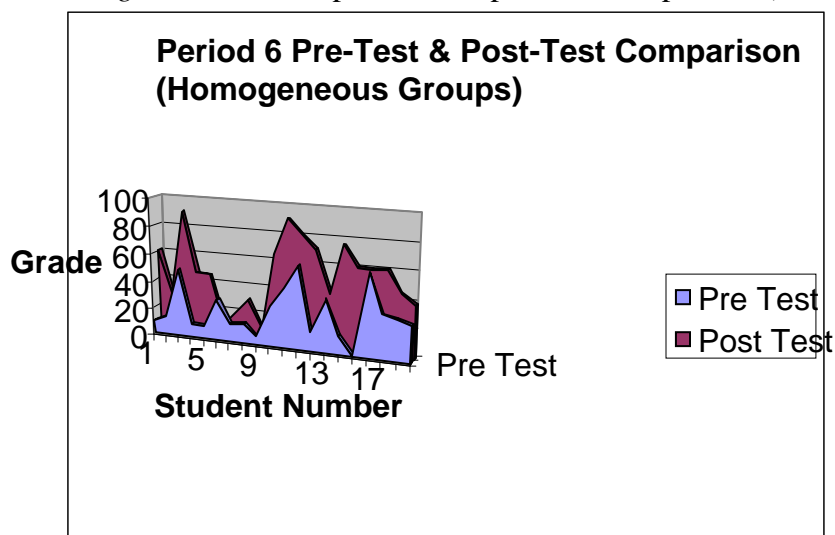


Figure 4. Period 6 pre-test and post-test comparison (homogeneous groups)

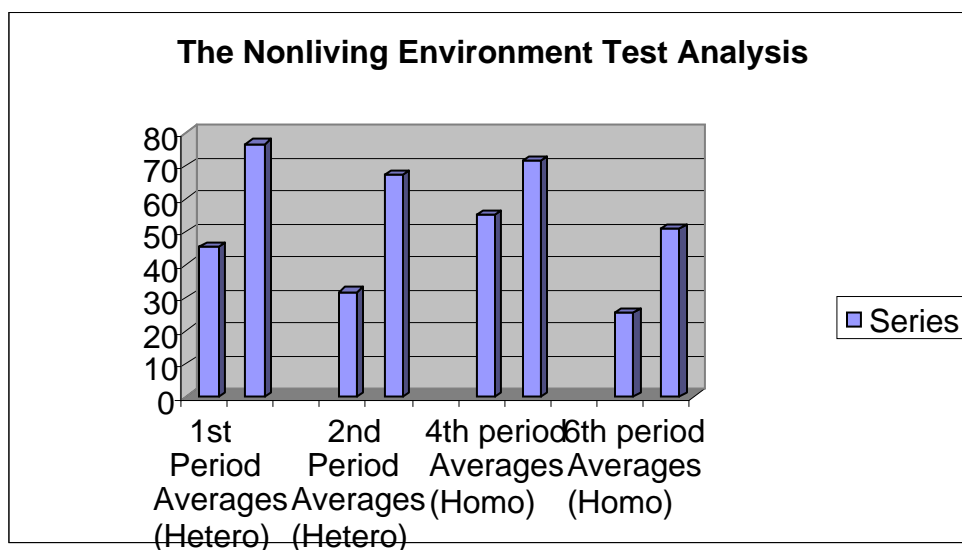


Figure 5. The nonliving environment test analysis

Results

The purpose of this exercise was to compare the academic achievements of students placed in homogeneous groups and students placed in heterogeneous groups. The students placed in the heterogeneous groups received higher average increases in scores than the students placed in the homogeneous groups. The grades of the students in the first period class increased by 31.3%. The scores of the students in the second period class increased by 35.4%. The students in the fourth and sixth period classes, that were placed in homogeneous groups, did not receive as high average score increases. These classes received increases of 16.3% and 25.7%, respectively.

The scores on the pre-tests and post-tests may have as much to do with the original class dynamics as with grouping. The first and second period classes contained students that tended to receive average grades on their course work. This would explain the average scores received on the pre-tests. Both of these periods scored lower than the

fourth period class but higher than the sixth period class. The fourth period class consisted of students that tended to score above average on the course work. This period received the highest average score on the pre-test. The sixth period class consisted of students that tended to score below average on course work. This period received the lowest average on the post-test.

Conclusions and Recommendations

Conclusions

Research has shown that students who work in groups receive a lot of benefits. Cooperative learning and group work can help to build a student's communication skills, can help increase tolerance and the acceptance of diversity, promote higher level reasoning, increase generation of new ideas, promote greater transfer of information from one situation to another, increase retention, build teamwork skills, reduce stress, and increase "willingness to attempt challenging tasks" (Baker & Campbell, 2005, ¶30). Teachers can form student groups in many ways. Groups can be modified to reflect the goals of the assignment. A teacher may place students in groups and control the methods by which they complete a task by having them use a particular cooperative learning model such as jigsaw. The teacher may even control the formation of the groups.

Teacher-formed heterogeneous groups and homogeneous groups were compared in this study. Students in a seventh grade life science class were given a pre-test about the nonliving environment. They were then given a lecture about the nonliving environment and then placed in homogeneous groups or heterogeneous groups. Within these groups, the students learned additional information about the nonliving environment that focused on the cycles of matter using the jigsaw cooperative learning model. At the conclusion of

the cooperative learning exercise, the students were given a post-test about the nonliving environment. The scores of the pre-test and post-test were analyzed and compared. Based on the data, the students that were placed in heterogeneous groups received higher scores on the post-test and higher academic attainment than the students placed in homogeneous groups.

The scores the students received on the pre-test seemed to be affected by the natural personalities of the classes. The first and second period classes tended to receive average scores on assignments prior to this exercise. They also received average scores on the pre-test. The fourth period class had a history of making above average scores. They received above average scores on the pre-test. The sixth period class had a history of below average scores. They received below average scores on the pre-test. However, after the students were placed in groups, the scores did not reflect the previous tendencies of the classes. This suggests the group placement and jigsaw activity affected the academic achievement of the students.

The scores on the post-test seem to be more influenced by the grouping and less by the class dynamics. The first and second period classes, which tended to receive average scores on the coursework, received higher score increases on the post-test than the students in the fourth period class. The students in first and second period were placed in heterogeneous groups for the jigsaw assignment. The fourth period class (homogeneous grouping), which tended to score above average on coursework received the lowest score increase of the four periods, and received a lower average score on the post-test than first period by 5.1%. The sixth period class (homogeneous grouping) received a higher score increase than the fourth period class but the score increase was

still lower than the averages of the first and second period classes (heterogeneous grouping).

The students that were placed in heterogeneous groups received higher average scores on the post-test than the students that were placed in the homogeneous groups. This may be because the students in the group were more diverse and had a broader foundation of information to access (Baker & Campbell, 2005). For example, in the first period class, one group had a student that received a 100% on the pre-test. The other members of the groups scored 30% and 14% on the pre-test. While the students completed the poster part of the jigsaw assignment, these students worked well together. They recognized each other's strengths and weaknesses and used them to their advantage. The student who scored higher on the pre-test was responsible for helping the other students understand the information. The other students were responsible for translating the information into a visual form on the poster. The clearly-defined roles and open communication enabled these students to work well together within their group. These students successfully completed the poster in the time allotted. They also received a significant grade increase. The student that scored 100% maintained a 100%. The student that scored 30% on the pre-test scored 85% on the post-test. The student that scored 14% on the pre-test scored 70% on the post-test.

Students that were in the homogeneous groups were limited to the type of foundation of knowledge of the group members and the social interactions within the group. This was particularly evident in the sixth period, class which consisted primarily of below-average students. Many of the students in the groups became frustrated because they did not understand the information or the task, and they did not have anyone else in

the group to ask for help. Because of these frustrations, the groups came close to falling apart and had to work extra hard to complete the assignment. Students that were in homogeneous groups in the typically high-achieving class also became frustrated. Even though these students understood the material, they did not work well with one another. Many times, more than one student tried to control the group, or there was not any control of the group, and there was lack of communication within the group. Roles and tasks were not clearly defined, groups were unorganized, and each person assumed everyone else in the group would take care of their own responsibilities without actually asking each person if they were taking care of their responsibilities. Sometimes there personality clashes.

Many questions and concerns arise from this investigation. Some students scored higher on the pre-test than they did on the post-test. This may be because of uncontrollable factors such as stress or personal reasons. Many students that were present for the pre-test were absent for the post-test. If these students were present, it may have affected the class averages. The students may not have been given enough time to complete the assignment. Many students said they felt rushed and pressured. There may have been a conflict in the lessons learned and the information that was tested. The students were tested on the nonliving environment, however, the jigsaw activity focused on the cycles of matter in an environment.

Recommendations

According to this study, when students work in heterogeneous groups, they perform better than students that work in homogeneous groups. However, before a teacher places students into groups, he or she should consider the goals of the assignment.

Baer (2003) suggests using homogeneous groups for academic achievement and heterogeneous groups for social interactions. The students that received higher scores had a strong social dynamic within their groups. These groups communicated well and had clear roles. The students that received the lower scores did not work as well in their groups.

Additional Implications

This study is applicable for science educators. Lin (2006) wrote in *The Science Teacher* about the importance of cooperative learning in science classrooms. She says that many science teachers have heard about cooperative learning and are aware of its benefits, such as increased academic achievement and communication skills, but are not sure how it can be used in their classrooms.

The National Science Teachers Association (NSTA) is an organization that aids the professional development of science teachers. It supports the use of cooperative learning in science classrooms. Many articles can be found on the NSTA website describing cooperative learning and how it can be used in the classroom. Paige Schulte wrote an article about the benefits of cooperative learning and how to use it in the classroom.

Teachers can integrate technology into their cooperative learning activities. Technology and cooperative learning can be used for conducting science experiments, conducting simulations, doing computer work, and solving technical problems. When cooperative learning is applied to technology the students can work together to complete large problems, divide the work into manageable segments, and help each other understand information (Flowers & Ritz, 1994). Teachers can use money from grants for cooperative learning and technology activities. For example teachers can use the

Tennessee Refurbished Computer program to receive 20 computers for their classroom (Grant Opportunities, 2007). Though a specific grant was not found for cooperative learning during this study the Department of Education and the National Science Foundation reward many grants for various projects.

Teachers should be given the opportunity to learn more about cooperative learning so they can apply the strategies in their classrooms. In addition, to reading literature, such as the article by Lin and Schulte, teachers may also benefit from workshops and videos about cooperative learning strategies.

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Appendix A

Name _____

Nonliving Environment Assessment

Pretest\Posttest (circle one)

Matching

Abiotic

Biotic

Atmosphere

Climate

Condensation

Evaporation

Food web

- a. a liquid changes to a gas
- b. a gas changes to a liquid
- c. “living”
- d. the air that surrounds the Earth
- e. a mixture of mineral and rock particles
- f. the amount of energy available at each feeding level in an ecosystem
- g. a model that shows all of the possible feeding relationships among organisms
- h. “nonliving”
- i. an area’s average weather conditions

List 3 abiotic factors that can affect a community

Explain two cycles of matter that effect the environment. List at least 3 steps in each cycle. You may use drawings. Please put the drawings on the back of the paper.

In a hypothetical environment there is grass, worms, rabbits, deer, bees, birds, bushes, and wolves. Draw a food web and an energy pyramid illustrating the relationship between these organisms. What do you think will happen if the wolves are removed from the environment? Place your prediction below the drawings.

Appendix B

Rubric for cycles of matter poster assignment using the jigsaw cooperative learning method.

Names _____

Cycle of Matter Rubric		
	Points Possible	Points Earned
Cycle of Matter	30	
Carbon Cycle, at least 4 steps (10 pts)		
Nitrogen Cycle, at least 4 steps (10pts)		
Water Cycle, at least 4 steps (10pts)		
Notes	25	
Each group member took clear notes on all of the cycles		
Poster	25	
Displays producers (5pts)		
Displays consumers (5pts)		
Displays at least one decomposer (5pts)		
The work is neat and accurate (5pts)		
Group Work	25	
Group members contribute equally. Each member takes notes, teaches those notes to the other group members and helps make the poster.		
Total Points	105	
Comments:		

Using Classwide Peer Tutoring to Increase High School Math Students' Academic
Performance

Stephen C. Durand

Education 590, Spring 2007

The University of Tennessee at Chattanooga

*The Institutional Review Board of The University of Tennessee at Chattanooga
(FWA00004149) has approved this research project 07-016.*

Introduction to the Problem

A basic and obvious goal of education is to increase the knowledge of students. This knowledge is largely measured by graded tests. Educators use a variety of instructional formats in their professional practices to maximize students' academic attainment. One method that has garnered significant attention is classwide peer tutoring. The following project has been designed to assess the effectiveness of this method in increasing high school math students' academic performance, as measured by graded tests.

Review of Literature

“Classwide peer tutoring is a highly effective and validated form of intraclass peer-mediated instruction that uses behavioral techniques to promote acquisition of academic and social behaviors” (Arreaga-Meyer, 1998, p. 89). In one study, classes of elementary school students who tutored each other daily in class increased their scores on weekly tests as compared to weeks when they received instruction during those minutes from the teacher (Greenwood, Dinwiddie, Terry, Wade, Stanley, Thibadeau, & Delquadri, 1984). In a study of 16 secondary school Spanish class students identified as at risk of failure (10 students) or learning disabled (6 students), the use of classwide peer tutoring raised students' scores on weekly tests to 80% and higher for all but two students. In addition, all the students learned Spanish vocabulary words almost as fast as the tutoring system permitted (Wright, Cavanaugh, Sainato, & Heward, 1995).

In a large-scale, longitudinal study of elementary school students over 4 years, students who participated in classwide peer tutoring in spelling, reading, and math made

significantly greater gains on the Metropolitan Achievement Test (Basic Battery, i.e., Reading, Language, and Mathematics subtests) than did an equivalent control group that received conventional instruction methods. In a follow-up assessment of these students 2 years later, it was found that the classwide peer tutoring group had 9% fewer students going into special education than did the control group (Greenwood, 1991). In addition to its use at the elementary and secondary levels, classwide peer tutoring has also helped adults achieve basic literacy (Imel, 1994).

In an analysis of 65 programs, Cohen and others established that peer tutoring improves academic performance (cited in Gaustad, 1992). Peer tutoring is effective in improving both the tutee's and the tutor's academic development; in fact, the gains for the tutor tend to outpace those for the tutee (Gartner & Reissman, 1993). Having students tutor each other lets each one be the tutor, thus making learning more effective (Imel, 1994).

The results of the overarching concept of cooperative learning may be applied to arguments for classwide peer tutoring, as researchers combine discussions of classwide peer tutoring with cooperative learning in the literature (Greenwood, Carta, & Hall, 1988; Maheady, Sacca, & Harper, 1987). Although cooperative learning can involve highly structured group activities, it may also be broadly defined as "students working together in a group small enough that everyone can participate on a collective task... Not all tasks assigned to cooperative groups are true group tasks. Some could be done as individuals and have the character of collaborative seatwork" (Cohen, 1994, p. 3).

Cooperative learning groups often vary in size from as few as two students to as many as six (Blosser, 1993). Classwide peer tutoring involves pairs of two students

(Arreaga-Meyer, 1998). Classwide peer tutoring may, therefore, be considered a variation of cooperative learning, with two students per group. In a class, by using cooperative learning groups of two, which cooperative learning advocates mention as a strategy (Cohen, 1994; Johnson & Johnson, 1990; Panitz, 2000; Terwel, 1990), we get classwide peer tutoring.

In a 1991 analysis of 67 studies comparing cooperative learning with traditionally taught control groups, Slavin found that 41 (61%) of the studies showed significantly greater achievement in cooperative classes. In only one study did the control group perform better than the cooperative group. In a 1984 analysis of 122 studies, Johnson and Johnson determined that cooperative learning fosters greater achievement than does competition or individual work, and that this holds for all age levels and all subjects (cited in Blosser, 1993). A meta-analysis of 17 studies comparing competitive and cooperative math learning and 31 studies comparing individualistic and cooperative math learning indicated that “students at the 50th percentile in the cooperative condition would perform at the 71st percentile in the competitive condition and at the 75th percentile of the individualistic condition” (Johnson & Johnson, 1990, p. 107).

Having noted the academic effectiveness of students working together, it is useful to view what the literature says about how they should do so. The literature states that students should be trained to use positive statements when tutoring each other (Gensemer, 2000). Untrained tutors may resort to the use of scornful put-downs (Gaustad, 1993). Therefore it is important to have students practice encouraging and validating each other, as well as restating and clarifying material (Imel, 1994).

The literature also mentions that peer pairs tend to be more comfortable with same-sex partners (Gensemer, 2000). Mixed gender groups can exhibit problems of male dominance. Siann, McCleod, Glisso, and Durndell (1990) found that mixed-gender pairs working on a computer programming exercise displayed social dominance by the boys, whereas the girls were less successful and motivated. In contrast, in another study of students working on a computer task, Underwood and McCaffrey found that single-sex pairs were more productive than mixed-sex pairs (cited in Cohen, 1994). Therefore, using same-sex pairing may not only make students more comfortable, but it might also aid their achievement.

The positive view of classwide peer tutoring from the literature provides support for my study. The purpose of my study was to describe the effects of classwide peer tutoring on the academic performance of high school mathematics students. My research question was: Does the daily use of classwide peer tutoring for 5 to 10 minutes in math class improve students' grades on tests?

Data Collection and Results

Data Collection

Subjects

The subjects were math students in two separate classes (third and fourth blocks) at an alternative high school designed to improve the academic performance of underachieving students. The students in both blocks received computerized instruction in a variety of courses. These courses included Algebra I, Geometry, Algebra II, and Money Management. There were nine subjects in the third block (five females and four males) and eight subjects in the fourth block (five females and three males). The students

were in 10th through 12th grades. The students in the two classes were all Caucasian. The economic backgrounds of students at the school varied.

Materials

The materials used were the school's computers, which carried the NovaNET instructional delivery system, as well as paper and pencils for taking notes and solving math problems.

Methodology

The study lasted 4 weeks. During the first 2 weeks of the study, I tutored students in one class (fourth block), which was the initial control group, providing individualized instruction, as needed. During this time, the students had daily computer-assigned lessons and tests.

Concurrently, I encouraged the students in the second class (third block), which was the initial experimental group, to form single-sex pairs, although I said that mixed-gender pairs were acceptable due to the age of the students. The students in the second class also had daily computer-assigned lessons and tests. I individually tutored them, as well. For 5 to 10 minutes each day, the students in these pairs took turns explaining problems to each other; they talked while they worked. I instructed students to speak quietly to keep the general noise level down. I monitored the class to make sure the tutoring proceeded smoothly. If a student was stuck on a problem, he or she got help from the partner, who provided as little information as was required. If both students were stuck, I guided them in how to work the problem, giving them the minimum amount of help needed.

At the end of the initial 2-week period, I reversed procedure between the two classes. In this subsequent 2-week period, the first class became the final experimental group, and the second class became the final control group. During this time, the students in both classes had computer-assigned lessons and tests, as they had before. I continued to tutor students individually in both classes. For 5 to 10 minutes of each class, students in the final experimental group (fourth block) tutored each other in pairs on a classwide basis, just as the initial experimental group had done. Again, I encouraged students to form single-sex pairs, but I permitted them to work in mixed-gender ones if they preferred.

In terms of qualitative research validity, I have kept computer printouts of all students' lesson and test grades so that I have two sources of data for triangulation in order to establish credibility. In order to provide transferability, I have kept detailed descriptive data of the context in my daily field notes. The field notes help to explain any distortions in the grade data. Reliability is ensured by the standardized fashion of the computer-assigned daily lessons and tests, which come from the NovaNET system.

In my quantitative analysis of the data, I have computed means, medians, and standard deviations of grades for each class for both the control and experimental phases of the study. I have included a lengthy table containing these aforementioned statistics, which are also listed by course (Algebra I, etc.).

Results

For the nine, third-block students during the experimental condition of classwide peer tutoring, the mean grade, median grade, and standard deviation were 85.6, 87.5, and 6.1, respectively. For the eight, fourth-block students during the concurrent control

condition of no tutoring, the mean grade, the median grade, and the standard deviation were 77.6, 80.0, and 14.0. For the nine third block students during the control condition of no tutoring, the mean grade, median grade, and standard deviation were 88.8, 87.5, and 8.1. For the eight fourth block students during the concurrent experimental condition of tutoring, the mean grade, median grade, and standard deviation were 76.0, 85.0, and 18.4. The mean grade, median grade, and standard deviation for the tutoring condition in both blocks were 81.9, 85.0, and 13.2. The mean grade, median grade, and standard deviation for the no tutoring condition in both blocks were 83.6, 84.0, and 12.6. The results are summarized by course and block in Figure 1.

	Tutoring (Experimental Condition)			No Tutoring (Control Condition)		
	Mean	Median	Standard Deviation	Mean	Median	Standard Deviation
Both Blocks – All Courses (17 Students)	81.9	85.0	13.2	83.6	84.0	12.6
Third Block – All Courses (9 Students)	85.6	87.5	6.1	88.8	87.5	8.1
Fourth Block – All Courses (8 Students)	76.0	85.0	18.4	77.6	80.0	14.0
Algebra I – Both Blocks (6 Students)	68.0	67.0	14.2	76.7	78.5	7.0
Algebra I – Third Block (3 Students)	82.0	82.0	3.0	80.3	80.0	2.9
Algebra I – Fourth Block (3 Students)	54.0	54.0	1.0	73.0	77.0	7.9
Algebra II – Both Blocks (5 Students)	87.0	90.0	5.0	89.7	87.0	7.6
Algebra II – Third Block (2 Students)	85.5	85.5	5.5	100.0	100.0	0.0

Algebra II – Fourth Block (3 Students)	90.0	90.0	0.0	84.5	84.5	2.5
Geometry (1 Student – Fourth Block)	85.0	85.0	0.0	55.0	55.0	0.0
Money Management – Both Blocks (5 Students)	89.4	91.4	7.0	93.9	94.5	5.6
Money Management – Third Block (4 Students)	87.5	90.7	6.6	92.4	91.3	5.3
Money Management – Fourth Block (1 Student)	97.0	97.0	0.0	100.0	100.0	0.0

Figure 1. Tutoring condition and scores.

Conclusions and Recommendations

Based on the literature, I had anticipated that the use of classwide peer tutoring would increase my students' grades. However, taken as a whole, the results of the study are fairly inconclusive. The mean grades for both blocks were actually lower during tutoring (85.6 for third block and 76.0 for fourth block) than during no tutoring (88.8 for third block and 77.6 for fourth block). Consequently the mean for the tutoring conditions in both blocks (81.9) was lower than the mean for the no tutoring condition in both blocks (83.6). However, the median grades for the two blocks either stayed the same during tutoring and no tutoring (87.5 for both conditions for third block) or went up during tutoring (from 80.0 to 85.0 for fourth block). Accordingly, the median for the tutoring conditions in both blocks (85.0) was higher than the mean for the no tutoring condition in both blocks (84.0).

Tutoring produced different effects, depending upon the individual students, which was readily apparent due to the small sizes of the two classes. Students who showed a tendency for off-task behavior, in general, increased this behavior during tutoring, and such off-task behavior likely was, for example, at least part of the reason for the mean grade of 54.0 during the tutoring condition for the three third block Algebra I students. Therefore, I routinely had to enforce on-task behavior during tutoring time. Nevertheless, tutoring did enable students to have others go over their work with them, thereby enabling students to avoid errors or to correct them. This error prevention and correction, for example, may have been, at least, part of the reason that the lone fourth block Geometry student scored 30 points higher during the tutoring condition.

Overall, the most useful recommendation one could make from this study is to carry out more study. The various citations in the review of literature section give a positive outlook on classwide peer tutoring. In fact, the National Council of Teachers of Mathematics (NCTM) supports peer mentoring and cross-age tutoring as ways to fulfill the Equity Principle in its *Principles and Standards for School Mathematics* (2000). Even so, the fact that the mean grades in this study during tutoring went down for both blocks, while the median grades either stayed the same or went up, implies that classwide peer tutoring is not always a decidedly effective strategy. The effects of tutoring in this study were ultimately neutral. More study would help to further validate the positive impact that classwide peer tutoring can have on students' grades.

As far as teacher professional development is concerned, training in the implementation of classwide peer tutoring is warranted due the successful studies found in the literature and due to the positive consensus view of the NCTM on peer tutoring. Such training is appropriate in university teacher preparation programs, and, even more so, in in-service activities at teachers' schools. Although I know of no grant programs targeted solely towards classwide peer tutoring, I am aware that the U.S. Department of Education's Office of Special Education has awarded many grants for the study of the effects of classwide peer tutoring (Juniper Gardens Children's Project, 2002). Also, despite the fact that computers were used in the two classes mentioned in my study, the use of modern technology is not required in classwide peer tutoring. Traditional textbooks, paper, and pencils are sufficient.

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Effective Strategies for Mastering Spanish in Grades 9-12

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Education 590, Spring 2007

The University of Tennessee at Chattanooga

The Institutional Review Board of The University of Tennessee at Chattanooga (FWA00004149) has approved this research project 07-002.

Introduction to the Problem

Students at the school do not thrive in Spanish class, and many fail without attempting the work. Grade point averages range from 0.0 to 4.0, the latter being less common. In order for these students to succeed, there must be some revision in what we do, as teachers. There are many variables that affect student learning that teachers cannot control, such as home life, finances, and pregnancies. Nevertheless, current educational trends state “that all children can learn if given an opportunity to do so.” Thus, one is faced with the dilemma of reaching students, despite the above-mentioned obstacles. The one variable within teacher control is the teaching strategy. Thus, finding an effective method, as well as good procedures to put into practice, is the focus of my research.

The school is a Title I school, known for the disturbances that students create, as well as the lack of learning that occurs within its walls. The school serves a population of students at risk, composed of 97% African Americans, 2% Caucasians, and 1% Hispanics; 98% of these students receive free or reduced-cost lunch. The school has been targeted by the state for not meeting the expected yearly progress, both in attendance and on scores on state-mandated tests. Many of the students served drop out of school, and many more simply do not continue onto higher education. Faced with these seemingly insurmountable social problems, is there any method that will reach this school’s students?

Review of Literature

Classrooms and students have changed drastically through the years, and what once was effective teaching fails to reach at-risk students today. Tomlinson (2001) states that public schools teach diverse populations from different cultures with varying learning

styles. Today's student interests differ on topic and intensity, and their level of readiness to assimilate new material also varies. Learners may or may not possess the adequate schema to be able to construct meaning from the lessons being taught. Students in the 21st Century have many advances that can cater to their personalities or interests, but classroom instruction does not always achieve the goal of personalization. It is to the teacher's advantage to address this problem by modifying instruction in the classroom. Tomlinson (2001) calls it differentiated instruction, defined as a proactive approach that is student-centered, and emphasizes quality instead of quantity by using multiple methods to help students address the content, the process, and the product. Heacox (2002) defines it as challenging instruction that focuses on essential learning, and that provides the opportunity for students to make choices. Students become part of a learning community that supports its members, and helps them succeed. Differentiated instruction implies that a teacher uses various instructional strategies in order to challenge and motivate students. Heacox (2002) explains that a teacher who wants to differentiate should start small, by trying one idea or strategy, at a time, until he or she feels confident in using it. Procedures must first be established in order to achieve success, and to ensure order in the classroom. Tomlinson (2001) states that there are many strategies that support the differentiated process, and one of them is cooperative group work. This strategy makes it easier for a teacher to reach out to individuals, and to match processes to learners. Cooperative group work requires a high level of organization on the part of the teacher so that there is no waste of time in the classroom. Cooperative group work allows the teacher the opportunity to become a facilitator and guide, while giving the students the support system they need, as well as the ability to make choices. Bennett and Rolheiser (2001)

use cooperative groups to create mental maps by giving each member of the group the opportunity to fulfill various roles. They design group work around activities that last about 15 minutes, and are consistently structured. Cooperative group work is described as one of many methods, and not an answer to all problems in the classroom; it should be combined with a number of other strategies to be successful (Bennet & Rolheiser, 2001).

Wong and Wong (2005) describes cooperative group work as a win-win situation for parents, teachers, students, administration, and humankind. This type of structuring allows the groups to work together, and gives students the responsibility of managing the classroom. Students also get the opportunity to learn from each other, and to become successful leaders. Wong and Wong (2005) explains that procedures must be clear when a teacher attempts this strategy, in order for students to be successful. Guidelines, such as the number of members, activity duration, and the reason for group work, must be clearly established before trying this procedure. There are four keys to successful group work: positive relationships, social skills, individual accountability, and assessment. These keys will determine how effective a group activity will be. If students can work well together to solve their differences in a civilized manner, then quality work can be produced.

Cooperative group work is effective in the foreign language classroom because communicative competence can only be achieved by daily practice and performance in the target language. Ommagio Hadley (2001) explains that sociolinguistic competence entails that the target language is used to describe, narrate, elicit information, persuade, and exchange ideas in context. Communication mastery requires interpersonal relationships, and social skills that can only be achieved when students can work together effectively. Language competence and performance require that students practice both

verbal and nonverbal cues to make sense of the language. Moreover, learning a second language is done more efficiently when meaningful and relevant interactions occur. The ability to cope, and adapt to interlocutors, cannot be done in isolation, but in social settings.

Data Collection and Results

Data Collection

Methodology

This project lasted 3 weeks, and provided students with clothing vocabulary, as well as cultural information about Hispanic Fashion designers; it served a total of 70 pupils in grades 9-12. Students had to master the writing and speaking components to comply with state standards for foreign language for intermediate level students (Tennessee Department of Education, 2007). This research is the culminating experience for the M.Ed. program at The University of Tennessee at Chattanooga, and was directed by a graduate student who is also a 2nd-year teacher within the Hamilton County Department of Education.

Instructional design

Two groups of 35 participants attended Spanish class daily for 3 weeks. The daily instruction lasted 90 minutes, for a total of 22.5 hours of instruction and practice.

Computer time was available to one group of students, as well as appropriate instruction to use these computers. Students were pre-tested to gauge their knowledge of vocabulary and grammar, and the same test was used for the post-test (see Appendix B). Attitude surveys were also given to determine if there was a distinct difference between both groups of students, and to compare attitude with testing score. After the pre-test was

administered, students were taught the material that students needed to master in order to pass the formal assessment. Students completed verbal and written practice, and, at the end of the unit, students in one of the classes were divided into groups of five to create a podcast, while students in the other class worked individually. However, because of the nature of the subject being taught, both groups of students had to work with partners, after lecture, in order to do speaking practice. After their projects were completed, a post-test was administered to determine what they actually did learn. A rubric was used (see Appendix C) to determine student engagement and verbal proficiency (see Appendix D). Informal observations were used to measure on-task behavior. The Spanish material and the teacher for both sections were identical. For the group of students who were taught to use Macintosh computers, a 30-year, veteran teacher taught the process.

The first group of students worked in groups to produce a podcast in Spanish. They were taught the vocabulary in sections in order to put it together in a recording that would be used to teach other students. Students took pictures of clothing items, and labeled and recorded the names to create a lesson. Then they created a skit to show how to help a customer in a clothing store. The students had to learn to use the computers at the same time that they were trying to do their Spanish work. The groups were selected according to who was present that day, and not according to strength or grade point average.

The second group of students had to create a fashion line that included day, evening, and uniform attire for boys and girls. The clothing line was labeled in Spanish, and students presented it to the class, describing it in the target language. Each day, all students had a mini-lesson where they learned vocabulary meaning and pronunciation,

followed by a session in speaking practice, and finished by individual work. Students also had to present a skit demonstrating how to help a customer in a clothing store. The skit required that the students act out the situation, and use props or visual aids to make it more interesting and fun.

Results

The following standards (see Figure 1) are part of the Tennessee Standards for foreign language. A narrative form is presented in Appendix A. At this time, there is no required accountability test.

Standards	
Communication	1.1, 1.2, 1.3
Culture	2.1
Comparisons	3.1, 3.2
Connections	4.1, 4.2
Communities	5.1, 5.2

Figure 1. Tennessee foreign language standards met through project activities.

After 3 weeks of research, results indicated that only 56% of students passed the post-assessment with grades higher than an 80% (see Figure 2). This number is the total amount of passing scores from both groups. In group one, 29% of the students passed with scores of 80 and above; in group two, only 27% received these scores. The group with the higher scores, group one, believes that they are able to do the work in Spanish class, even when it is not done due to absences or suspensions (see Figure 3). Group two faces a lot more insecurities in their abilities to do the work, which is evident in their attitude toward the work, reflected in the survey (see Figure 4). The grade point average of the students in both groups ranged from 0.0 to 4.0. Students who received a grade of 80 or above also hold a grade point average of 3.0 or above. Students who worked in a

cooperative group had a higher rate of success than those who worked individually; however, the percentage of students who actually mastered 80% of the vocabulary or higher did not reach expected levels. Cooperative groups depended on attendance, and the responsibility of members for success, while students who worked individually, were able to finish a lot faster than their grouped counterparts. Group two students did not depend on anyone else to do the work; nevertheless, their on-task behavior was less than pupils who worked in groups. The finished product of the cooperative groups was of higher quality than individual projects, although the retention of the material was elusive, at best, in both groups.

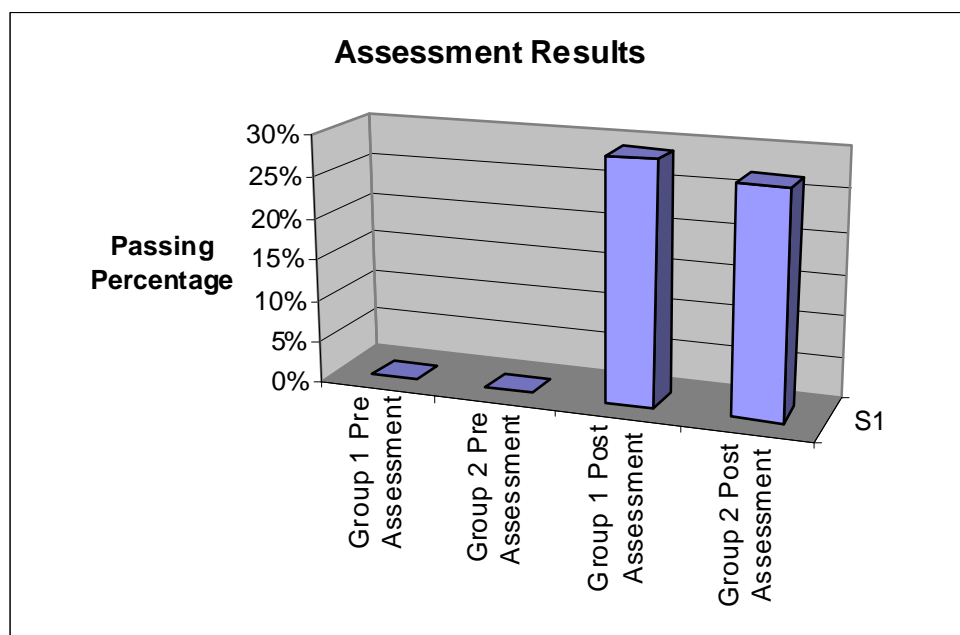


Figure 2. Assessment results.

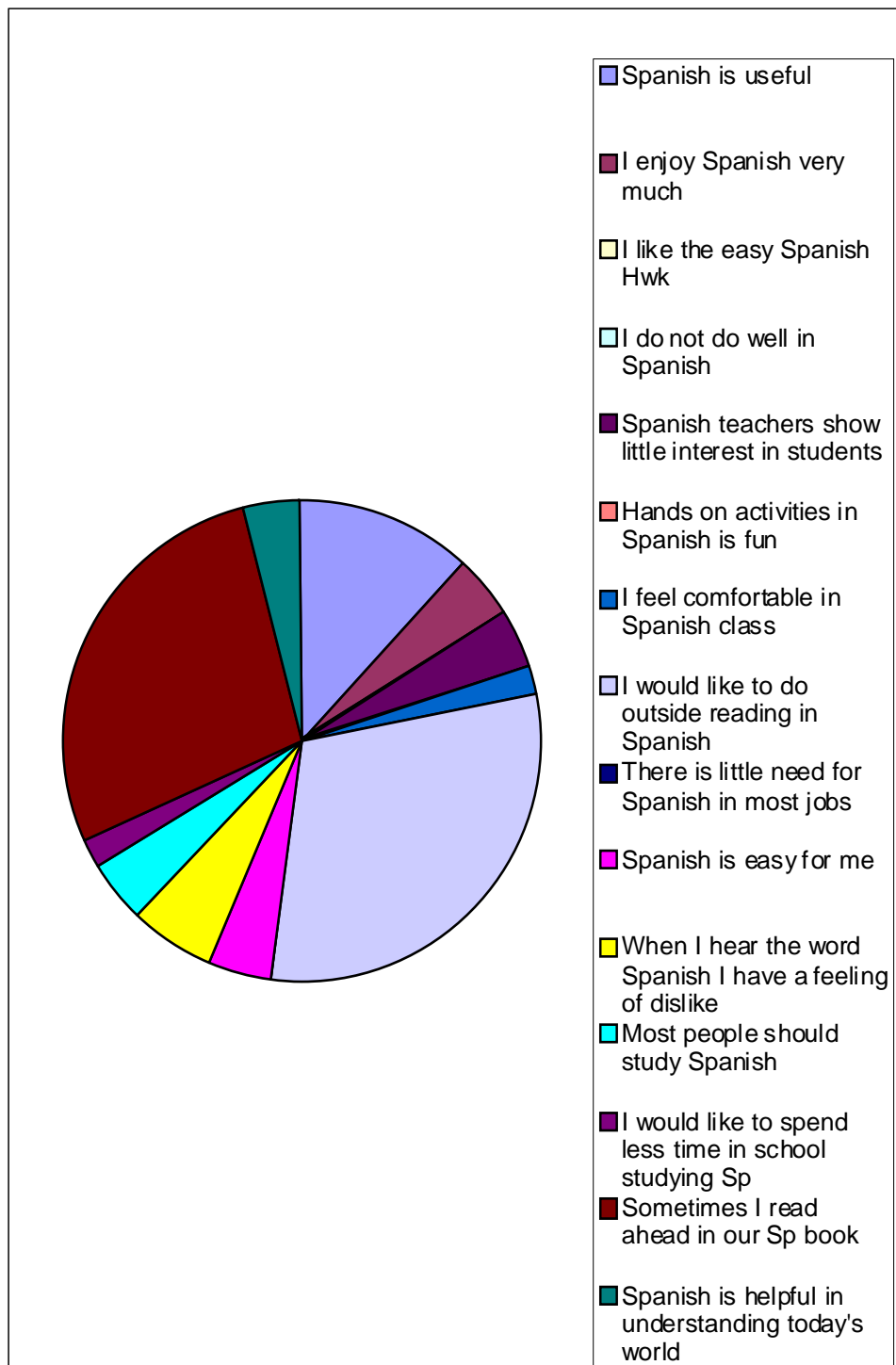


Figure 3. Attitude survey, group 1.

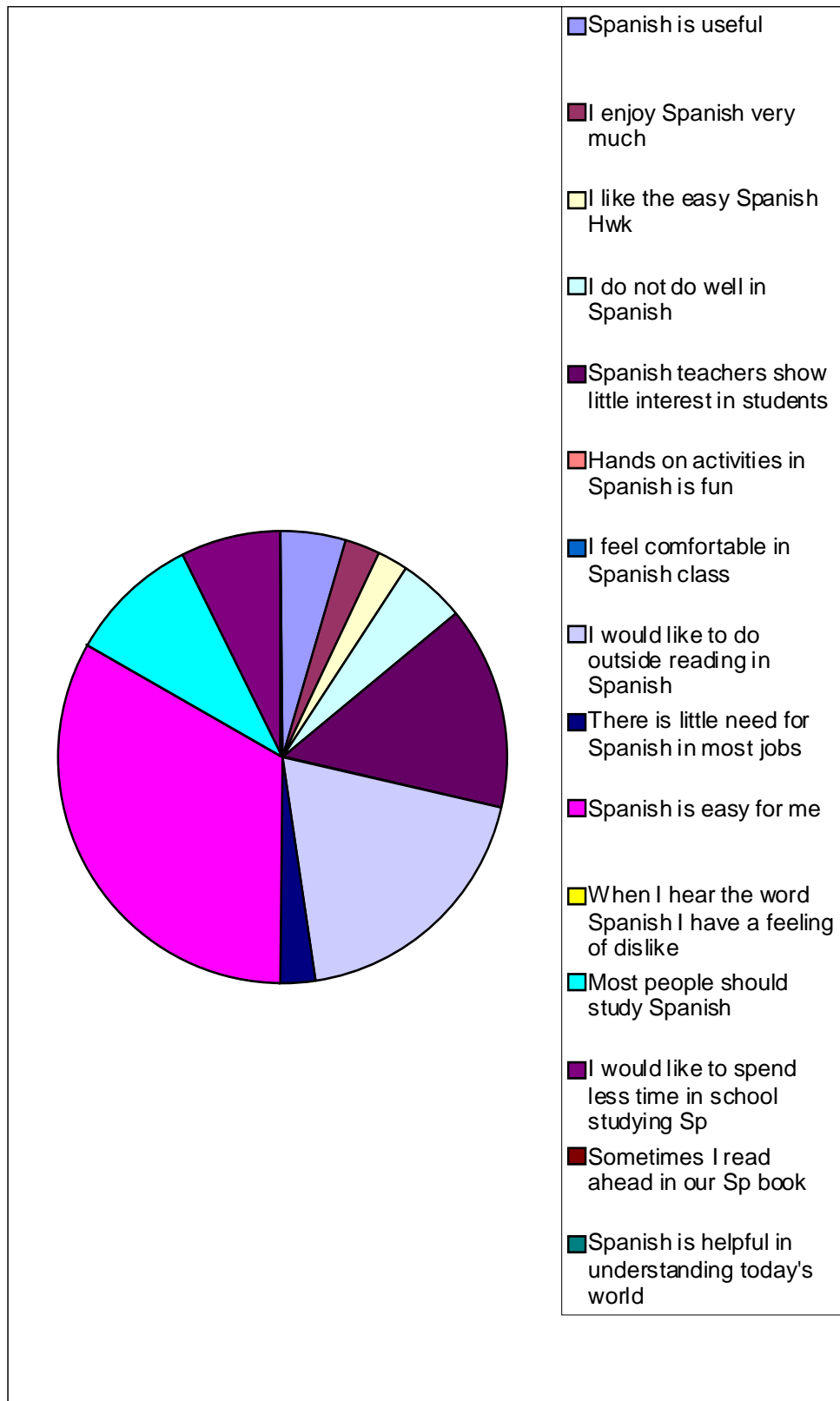


Figure 4. Attitude survey, group 2.

Conclusions and Recommendations

Conclusions

The assumption behind this research was that cooperative learning provides greater opportunity for learning, and developing a sense of community, than does individual work. Students in cooperative groups had the opportunity to help each other, which increased their chance to succeed. Interestingly enough, students at the school seem to be very social except with regard to their education. They seem to lack the confidence to state and defend their ideas in a group setting. However, students did benefit from working in groups, and this skill will translate later in their careers of choice. Because they will not be isolated, but work in communities, problem solving will be beneficial in any path they select. Grouped students were able to have a support system instead of being isolated. They bounced ideas off each other, and they practiced using the target language in context.

Consistent attendance, or, the lack thereof, was key in this research. Students who felt defeated about school were the most likely to be absent or not want to carry their weight in the classroom. It seemed that they felt that it would be better to fail while not trying, than to try, and fail in front of their peers. These were the students who had grade point averages that ranged from 0.0 to 2.0. This attitude permeated in both groups, and made it difficult for the teacher and the students, alike. Cooperative group members kept each other accountable, yet there were many personality conflicts, and the need to diffuse misunderstandings or possible fights made this process painfully difficult. Students needed to have more training in how to work as a group before this research took place. Another difficulty was the lack of computers and materials. Many times, the computer

instructor was not available or the machines did not work as they should have. Students were in groups of five because of the lack of space and resources. This type of grouping created an additional challenge for the students since they had to take turns, and wait for others to finish their part of the recording. Also, it was a great challenge to orchestrate the time and the place for students to learn to work with the computers, since there is not a designated area for this purpose. Computer training became a constant source of irritation when the computers did not work as expected, or when the computer instructor was not available. Most students in the class did not know how to work with Macintosh computers, and even though it was exciting, at first, to find out what they could do. The excitement soon wore off when students had to recover the information they had completed the previous day, because it had somehow been lost. Moreover, students who were interested in success became impatient, and annoyed at the lack of reliability of their classmates. It was impossible to predict what group of students would show up, and on what day. Lack of attendance made grading difficult when only a few members did most of the work. Students who worked consistently found it unfair to receive the same score as a student who contributed little.

Individual students, who did not depend on anyone else to do their work, were not driven to complete their projects. Regardless of the fact that they had a time limit, these students spent a lot more time off task than their grouped counterparts. Perhaps the fact that the product was a different kind, and it did not involve the technology that group one learned to navigate, was an important factor in the lack of interest. Students who were not artistically inclined soon were defeated by the task of creating a fashion line of their own. In this particular project, the lack of materials was an even bigger problem than with

computer use. Another setback was the student's dependency on the teacher as the only source of information, and their reluctance to accept help from anyone else. In a classroom of 35 students, this is an impossible task for only one teacher to accomplish, especially when there is not a buddy system established to provide support when the teacher is busy. Many students quickly gave up and sat waiting for the next available turn. This class was the most difficult class to observe since they wanted a lifeline and constant reassurance that could not be provided for them. If these students had had the opportunity to work in groups, this project would have been more doable for the majority of the students who wanted to do well, but lacked the artistic eye to create a good piece.

Regardless of the setbacks and the disappointing results, group work is an effective strategy for at-risk students; nevertheless, the project needs to be adapted to take into consideration attendance and resources. These setbacks were a source of frustration that was not foreseeable or controllable.

Recommendations

Some of the information that was gathered was not as useful as expected. The attitude survey and student's current grade point average presented an overall idea of the type of students being served, but it did not influence the grouping or the design of the project. In the future, it would be more convenient not to take the time to record all this information, but to concentrate on the amount of the material covered in the unit and the resources available, as well as group procedures and grading.

Moreover, the amount of information covered in this unit was quite extensive to be completed in only 3 weeks. Students needed more time to learn the material or less information to master. It might be advisable to cut back or to rearrange the information in

smaller segments, to make the material a bit easier to digest. Three possible parts could be clothing, culture, and how to help a customer at a clothing store. Writing and speaking were assessed in this unit, but it would be less challenging to address one component at a time.

Furthermore, resources played an important part in this research. The lack of computers, computer instruction, art materials, and space provided an extra challenge to this process. At the beginning of the project, all the necessary materials were gathered, but, as the unit unfolded, and students worked, the supplies dwindled quickly. Computers broke down for several days, and students lost valuable information that could not be graded until several weeks later; therefore, students could not get immediate feedback on their projects. Students needed to present their project to the class, but there was no projection device available.

Most importantly, group grading and procedures would be the area for more extensive research. At the beginning of this investigation, the underlying belief was that putting a group of students together to create a product was the extent of the strategy. Then, as the project unfolded, many discoveries were made, such as the lack of appropriate grade recording techniques, and the need for students to improve social skills. The process became one of behavior control rather than facilitating learning. Students needed further training on what each role entailed, and how to perform these roles well. In the future, it would be advisable to use procedures for effective group work (e.g., Wong & Wong, 2005), and to make sure students know how to perform in a group before they are expected to produce a product together.

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Appendix A

Narrative Form of Expectations, Student Performance Indicators

Modern Foreign Language Standards

Communication

- 1.1 Communicate in Languages other than English.
- 1.2 Students understand and interpret written and spoken language on a variety of topics.
- 1.3 Students present information, concepts, and ideas to an audience of listeners on a variety of topics.

Culture

- 2.1 Students demonstrate knowledge and understanding of daily life, traditional ideas and perspectives, institutions, literary and artistic expressions, and other components and aspects of the cultures being studied.

Comparisons

- 3.1 Students reinforce knowledge of other disciplines through the foreign language.
- 3.2 Students acquire information and recognize the distinctive viewpoints that are only available through the foreign language and its cultures.

Connections

- 4.1 Students demonstrate understanding of the nature of language through comparison of language studied and their own.
- 4.2 Students demonstrate understanding of concept of culture through comparison of cultures studied and their own.

Communities

- 5.1 Students will use the language both within and beyond the school setting with representatives of the target cultures in a variety of ways.
- 5.2 Students will use the language for leisure and personal enrichment.

Appendix B

Formal assessments

Unit Pre and post- test/ Fashion unit.

I. Answer the following questions with complete answers. This is a sample of a conversation.

1. Hola, ¿como esta?
2. ¿Puedo ayudarle?
3. ¿Qué talla busca?
4. Aquí tiene usted.
5. Que color le gusta?
6. ¿Como va a pagar?

II. Write the letter of the word in the textbox that defines the word in Spanish. Write them on your answer sheet.

7. Blusa
8. Falda
9. Pantalones
10. Camisa
11. Vestido
12. Zapatos
13. Camiseta
14. Medias
15. Abrigo
16. Chaqueta

- | |
|---|
| <ol style="list-style-type: none"> a. Pants b. Socks c. Jacket / coat d. Shoes e. Shirt f. Dress g. T-shirt h. Light jacket i. Blouse j. Skirt k. Jewels l. Belt m. Wallet n. Bathing suit o. Sunglasses |
|---|

IV. Write the name of the Fashion designer that best fits the description on the answer sheet

17. Born in the canary island to Spanish mother and Czech father. Has designed for Sarah Jessica Parker. Designs are sexy and alluring.

18. Born in Caracas. This wealthy designer rubbed elbows with Andy Warhol and royalty. Chic elegance is her seal.

19. Born to Cuban American parents, graduated from Parsons School of Design with a job offer to design for Donna Karan. Designer created Carolyn Bessette's (Kennedy) wedding gown. Designs are sexy and bold.

20. Born to Puerto Rican parents, this designer started a company named sweet face. Also worked with Andy Hilfiger and makes affordable designs for the everyday woman.

V. Read the following passage and answer the questions about the passage on your answer sheet.

Soy Elena. Me gusta el color rojo. No me gusta el color negro. Yo busco un vestido rojo y zapatos rojos. No quiero zapatos negros. Tambien necesito las joyas, me encantan!

21. ¿Que busca Elena?

- a. Rojo b. Vestido c. Negro d. None

Appendix C

Formal assessments

Collaborative work skills rubric.

Name: _____ Block: _____ Date: _____

Observations:

CATEGORY	4	3	2	1
Working with Others	Almost always listens to, shares with, and supports the efforts of others. Tries to keep people working well together.	Usually listens to, shares, with, and supports the efforts of others. Does not cause "waves" in the group.	Often listens to, shares with, and supports the efforts of others, but sometimes are not a good team member.	Rarely listens to, shares with, and supports the efforts of others. Often is not a good team player.
Focus on the task	Consistently stays focused on the task and what needs to be done. Very self-directed.	Focuses on the task and what needs to be done most of the time. Other group members can count on this person.	Focuses on the task and what needs to be done some of the time. Other group members must sometimes nag, prod, and remind to keep this person on-task.	Rarely focuses on the task and what needs to be done. Lets others do the work.
Time-management	Routinely uses time well throughout the project to ensure things get done on time. Group does not have to adjust deadlines or work responsibilities because of this person's procrastination.	Usually uses time well throughout the project, but may have procrastinated on one thing. Group does not have to adjust deadlines or work responsibilities because of this person's procrastination.	Tends to procrastinate, but always gets things done by the deadlines. Group does not have to adjust deadlines or work responsibilities because of this person's procrastination.	Rarely gets things done by the deadlines AND group has to adjust deadlines or work responsibilities because of this person's inadequate time management.

Attitude	Never is publicly critical of the project or the work of others. Always has a positive attitude about the task(s).	Rarely is publicly critical of the project or the work of others. Often has a positive attitude about the task(s).	Occasionally is publicly critical of the project or the work of other members of the group. Usually has a positive attitude about the task(s).	Often is publicly critical of the project or the work of other members of the group. Often has a negative attitude about the task(s).
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Appendix D

Formal assessments

Verbal Rubric

Name: _____ Block: _____ Date: _____

CATEGORY	4	3	2	1
Comprehension	Student understands all questions teacher asks.	Student understands most questions the teacher asks.	Student understands some questions the teacher asks.	Student understands a few questions the teacher asks.
Comprehensibility	Student can make him/herself understood all the time.	Student can make him/herself understood most of the time.	Student can make him/herself understood some of the time.	Student can make him/herself understood a few times.
Fluency	Student does not hesitate when speaking in Spanish.	Student hesitates once or twice when speaking in Spanish.		Student hesitates a lot when speaking in Spanish.
Vocabulary	Student knows all of the vocabulary + survival expressions.	Student knows most of the vocabulary and survival expressions.	Student knows some of the vocabulary and survival expressions.	Student knows little of the vocabulary and or uses English.
Grammar	Student uses correct grammar patterns and complete answers all the time.	Student uses correct grammar patterns and complete answers most of the time.	Student uses correct grammar patterns and complete answers some of the time.	Student uses correct grammar patterns and complete answers a few times and or uses English to communicate.

English as Second Language Students in a Kindergarten Classroom

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Education 590, Spring 2007

The University of Tennessee at Chattanooga

The Institutional Review Board of The University of Tennessee at Chattanooga (FWA00004149) has approved this research project 07-018.

Introduction to the Problem

English as a Second Language (ESL) affects a very large number of students in the United States. The trend is expected to continue to grow over the next several years. Children as young as 4 years old are entering school with little to no English speaking experience or ability. The topic was selected to explore the problems that ESL students face in school. This is a national, state, and local issue. ESL is valuable to the curriculum in Pre-K through fourth grade.

Assessing language knowledge and skills is a major role with regard to teaching and learning in ESL schools and classrooms. Teachers need exposure to the different teaching approaches and strategies. Not all teachers have bought into the belief of teaching English as a second language. It is so important that kindergarten ESL students have an educational environment that is conducive to diverse learning. ESL kindergarten students come to school with a language disadvantage on the first day.

Review of Literature

Language is important for teaching and learning in any classroom and equally important in culturally diverse classrooms. The National Association for the Education of Young Children (NAEYC, 1999, ¶ 1) feels “early childhood educators have a responsibility to understand how best to meet children’s needs and how to provide effective early education for all children. “The NAEYC (1999) believes the same principles of good practice can be used, no matter what the child’s and family’s spoken language is. The NAEYC (1999, ¶ 2) reports that “negative attitudes towards non-English speakers can lead to children’s difficulties in mastering English as well as their first language.” This issue may include teaching English as the primary or secondary

language. Czubaj (1995) feels educators make a huge mistake by teaching English as a second language. She believes English should be the primary language. Czubaj (1995, p. 109) states, “nowhere in the world does another country put their native language secondary. The native tongue is always the primary language taught to students in school.”

One of the major reasons there have been problems about teaching English as the primary language is because many professionals believe the students lose their identity when they are being instructed using English as the primary language. A student who leaves his country of origin will better benefit and enhance his identity by receiving instruction with English as the primary language (Czubaj, 1995). Language learning has proven to be one of the most difficult issues in schooling for non-native English speakers. Boody and Ding (2001) state there are some parents concerned that their children have learned English so well, and use it so often, that they are not keeping up with their native language. Educators must maintain high standards of English instruction to all students. Czubaj (1995, p. 109) states, “when a person is language illiterate (reading, writing, and speaking) the person’s chances for success are minimal.” Sheppard (2001) reports that students who have English as a second language often demonstrate problems with learning a new language, such as understanding and communicating. The other problems include vocabulary and grammatical errors in their writing and speaking. Too often, ESL students are wrongly placed in special education settings.

According to Goldenberg (1996), educators are beginning to address the needs of language minority students who fail academically because they cannot readily interact or

learn in an academic environment that places higher importance on English. Teachers have to recognize and address the needs of students with diverse backgrounds. Gersten (1996) believes students have a more difficult time with literacy and language growth during the transition from instruction in the native language to instruction that is delivered, largely, though English.

The debate is ongoing between whether or not to use English as the primary or secondary language in classrooms with minorities of different native tongues. That debate must continue in order to find the best strategy to help students improve in the classroom. Latham (1998) reports that most researchers believe that knowing two languages and perspectives provides bilingual children with a more diversified and flexible foundation for cognition than their monolingual peers have. Tsukamoto writes, “the ESL teachers need to be aware of the language that they use in the classroom. Since their students are the learners of the English as Second Language, then the teachers must pay close attention to how they speak English to their students” (Tsukamoto, 2001, p. 148).

Another issue concerning language in culturally diverse classrooms is the development of reading skills. The failure of many children to develop early reading skills that lead to academic and social success has led to national concern (Haager and Windmueller, 2001). Students who experience early reading difficulty often continue to experience failure in later grades. Haager and Windmueller (2001) feel that students whose primary language is other than English, and are learning English as a second language, usually have greater difficulties developing reading skills in the early grades.

Davalos and Griffin (1999) feel students are hindered in the diverse classroom unless the teacher finds ways to share the language and practices. Sharing the language in

the classroom helps empower students and teachers. Literacy difficulties affect many children in the United States, and the numbers are rising, causing problems for teachers in the classroom. Lanehart and Schultz (2001) believe the students must self-regulate and teachers must facilitate language issues. “As students develop their self regulating skills, they become active controlling participants who direct what they learn and how they go about learning” (Lanehart and Schultz, 2001, p. 83). The teacher has to provide opportunities for students to develop these skills and help them make the necessary connections. Teachers and the education community must decide how to best make these skill connections. According to Ingersoll (1996), to adequately attend to cultural diversity in the classroom, teachers must look first at their own cultural background and understand how their biases affect their interaction with students. Ingersoll (1996) states that, the better teachers’ knowledge of students’ cultural differences, the better opportunities teachers will have to instruct them.

An additional problem is that ESL students, who are normally the minorities, are looked upon negatively. Implications are that, “minority students are by their nature, less likely to be successful in school; that all members in a particular minority group will respond in the same way to a given approach to teaching” (Miller, 2001, p. 346). Sheppard (2001) feels there are a few strategies that can help meet the needs of students. First, listener-friendly instructions are beneficial to students who are learning English as a second language. Second, adapting the right textbooks can be an effective strategy for English language learners. Third, adapting class assignments and homework can benefit English language learners.

Data Collection and Results

Data Collection

Population

The students involved in this project are from an urban school in Hamilton County. The school's kindergarten ESL population is 67%. There are 19 students in this kindergarten classroom. Twelve of the students are ESL students. That is 63% of the classroom population. Seven students are non-ESL students.

Methodology

All 19 students were individually shown an alphabet chart (see Appendix A) for recognition assessment. The chart has 26 upper case and 26 lower case letters. The students had to say aloud to the teacher the correct alphabet shown.

Results

Five of the 12 ESL students recognized all 26 upper case and all 26 lower case letters. Another five ESL students knew 47 or more upper case and lower case letters. Two of the ESL students knew less than 46 upper case and lower case letters. On the other hand, three non-ESL students knew all the 26 upper case and all 26 lower case letters. One non-ESL student knew 47 or more upper case and lower case letters. The remaining three non-ESL students knew 46 or less upper case and lower case letters.

Students who recognized all	ESL students	non-ESL students
52 upper and lower case	5	3
letters	(42%)	(43%)
Students who recognized 47	ESL students	non-ESL students
to 51 upper and lower case	5	1

letters	(42%)	(14%)
Students who recognized 46	ESL students	non-ESL students
or less upper and lower case	2	3
letters	(16%)	(43%)

Figure 1. Data collection results.

Conclusions and Recommendations

Conclusions

Most public schools have moved away from the old “teach them all the same” method. More schools have placed an emphasis on multicultural education. This helps the kindergarten and other young students adjust to the many challenges they face being an ESL learner. The need to integrate language, culture, and content is to improve education with regard to changing school populations. The improvements will help teachers increase student academic achievement. In addition, if teachers are to increase learning opportunities for ESL learners, then they must be knowledgeable about the social and cultural aspects of teaching and learning.

The case study shows the ESL students are performing as well or better than the non-ESL students. The consensus of the local education community and department of education is that the ESL population will continue to grow and teachers need to receive the proper training to teach these students.

Recommendations

Recommendations are that all teacher preparation institutions offer required classes in ESL training. This training will prepare the new teacher to provide ESL students instruction based on best practices. Textbooks and other teaching materials must

be designed to address all students, including the ESL students. Educate the educators so they can change their way of thinking concerning these students. Many teachers look upon these students negatively. Teachers must change their own behaviors with regard to the diverse population they may teach.

Teachers should be required to attend teacher professional development sessions that focus primarily on teaching ESL students. The education community must be proactive in requiring teachers to become experts in diversity. Every day, teachers teach students with diverse backgrounds. Teachers should not simply group all students together for one teaching approach or teaching strategy.

There is grant money under the No Child Left Behind act to support further research in this area. More research is needed in this area. The findings need to be published and made available to all teachers, school administrators, and education stakeholders.

Technology plays a tremendous role in teaching ESL students. ESL students can benefit from using computer software that enhances instruction and provides remedial activities in language arts and other content areas. ESL kindergarten students would benefit from the various and different technology that aids their learning of the English language.

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Appendix A

Alphabet Chart

A	T	M	Z
G	L	Q	E
W	B	U	O
J	S	D	F
I	N	X	Y
R	P	C	V
K	H		
a	t	m	z
g	l	q	e
w	b	u	o
j	s	d	f
i	n	x	y
r	p	c	v
k	h		

__ = correct response
response

O = incorrect

Impact of Qualified Teachers on Head Start Education

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Education 590, Summer 2007

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Introduction to the Problem

The period from birth through age 5 is a critical time for children to develop the physical, emotional, social, and cognitive skills they will need to be successful in school and for the rest of their lives. Children from poor, disadvantaged families, on average, enter school behind children from more privileged families. Project Head Start, launched as an 8-week summer program of the Office of Economic Opportunity in 1965, was designed to help break the cycle of poverty by providing preschool children of low-income families with a comprehensive program to meet their emotional, social, health, nutritional, and psychological needs. In 1969, Head Start was transferred from the Office of Economic Opportunity to the Office of Child Development in the U.S. Department of Health, Education, and Welfare, and has now become a program within the Administration of Children, Youth and Families at the Department of Health and Human Services.

Both state and federal governments fund a wide variety of programs that are either intended to enhance children's educational development or better prepare children for school. Head Start is one of many federal and state programs that collectively provide approximately \$23 billion in funding for child-care and preschool education (U.S. Department of Health and Human Services, 2003). In programs other than Head Start, states have the responsibility and the authority, through planning, training, and the regulatory process, to make a substantial impact on the type and quality of services provided, and are held accountable for the delivery of high quality programs. Head Start's funding comes directly from the federal government, bypassing the state, which results in somewhat limited resources for Head Start programs.

Research tells us that early childhood education, implemented with qualified and well-trained teachers, can make a significant and meaningful impact on the development of children's knowledge and skills, their achievement in school, and success in life (U.S. Department of Health and Human Services, 2003). Unfortunately, limited resources prevent Head Start programs from hiring high quality teachers, and, thus, Head Start children are not receiving a high-quality education.

In this study, I will evaluate and compare the 2006-2007 school year progress and outcome reports from two Chattanooga Head Start preschool classrooms. One of the classrooms (addressed in this study as Classroom 1) is run by a certified teacher with a bachelor's degree in Early Childhood Education. The second classroom, (addressed in this study as Classroom 2) is run by a non certified teacher with an associate's degree in Early Childhood Education.

Review of Literature

Qualified preschool teachers make a difference. High-quality, early care and education administered by qualified teachers support school readiness with continuing effects in school performance and beyond. Barnett (2004, p. 7) states that "the knowledge and skills required of an effective preschool teacher have increased as science has revealed more about the capabilities of young children, how they learn best, and the importance of early learning for later school success." As Barnett (2004, p. 4) suggests, preschool teachers with a college education tend to be more effective. Studies have found teacher education to be related to the quality of preschool education and the development of children in preschool classrooms. Both general education and specific preparation in early childhood education have been found to predict teaching quality. Better-educated

teachers have more positive, sensitive and responsive interactions with children, provide richer language and cognitive experiences, and are less authoritarian, punitive and detached. The result is better social, emotional, linguistic, and cognitive development for the child.

America's preschools vary widely in teacher education requirements because standards vary across the different government agencies that sponsor and regulate Head Start, public school, and other preschool and child care programs. Consequently, Head Start education is less effective than it should be with varying educational effectiveness depending on teacher qualifications.

Olson (n.d.) believes that "research is confirming what common sense has suggested all along: a skilled and knowledgeable teacher can make an enormous difference in how well students learn. One Tennessee study found that students who had good teachers three years in a row scored significantly higher on state tests and made far greater gains in achievement than students with a series of ineffective teachers."

Another large-scale study by Stanford University School of Education Professor Linda Darling-Hammond and colleagues shows that certified teachers consistently produce significantly stronger student achievement gains than do uncertified teachers. Darling-Hammond, Holtzman, Gatlin, and Heiling (2005) examined data for over 4,000 teachers and over 130,000 students from Houston, Texas, linking student characteristics and achievement with data about their teachers' certification status, experience, and degree levels from 1995 to 2002. The results of their study of fourth- and fifth- grade students' achievement gains on six different reading and mathematics tests over a 6-year

period show that students who were taught by certified teachers consistently outperformed those who were taught by uncertified teachers.

Similarly, a North Carolina study (Strauss & Sawyer, 1986) found that teachers' average scores on the National Teacher Examination subtests measuring subject matter and teaching knowledge had a large effect on student pass rates on the state competency examinations.

The importance of providing low-income children with quality teachers is even recognized by famous actor and comedian, Bill Cosby. In 2004, Bill Cosby made an offer that the Stanford University School of Education could not refuse: a benefit performance with proceeds to establish fellowship funds for teachers in the Stanford Teacher Education Program (STEP) who commit to working in schools serving low-income children after they graduate. "Cosby's offer was stimulated by his desire to recognize the importance of good teachers for all students. He said it was a good teacher who made a difference in his life" (Mendieta, 2004, ¶ 3).

Darling-Hammond (2000) argues that teaching problem solving, invention, and application of knowledge requires a number of skills in teachers. They must have a deep and flexible knowledge of subject matter. They must understand how to represent ideas in powerful ways. They must be able to provide a productive learning process for students who start with different levels and kinds of prior knowledge. They must be able to assess how and what students are learning, as well as adapting instruction to different learning approaches.

Data Collection and Results

Data Collection

Population

Students. The population of my study includes a total of 35, four-year-old children enrolled in two different Chattanooga Head Start preschool classrooms, addressed in this study as Classroom 1 and Classroom 2. There are 19 students enrolled in Classroom 1 and 16 students enrolled in Classroom 2 (see Figure 1). Anonymous data was obtained through historical records.

	Classroom 1	Classroom 2
Gender		
Males	47%	50%
Females	53%	50%
Ethnicity		
American Indian, Alaska Native	0%	0%
Hispanic/Latino	0%	6%
Black, African American	84%	88%
White	0%	0%
Asian	5%	0%
Some other race or ethnicity	11%	6%

Primary Language		
English	95%	100%
Spanish	0%	0%
Other	5%	0%

Figure 1. Profile of students included in the study.

Teachers. Classroom 1 is run by a certified teacher with a bachelor's degree in Early Childhood Education and 3 years of experience as an educator. Classroom 2 is run by a noncertified teacher with an associate's degree in Early Childhood Education and 4 years of teaching experience.

Like most Head Start programs around the country, Chattanooga Head Start cannot afford certified teachers with, at least, a 4-year college degree due to limited federal funds. However, in 2002, as a part of President Bush's reform to improve children's school readiness, Chattanooga Head Start collaborated with the Hamilton County Department of Education whereby the Hamilton County Department of Education provides qualified teachers for most of the Chattanooga Head Start's classrooms. By 2011, all Head Start preschool classrooms will be staffed with qualified teachers.

Methodology

The Chattanooga Human Services Head Start/Early Head Start employs the Creative Curriculum Developmental Continuum, which is a valid and reliable assessment tool to obtain a comprehensive qualitative and quantitative picture of the program's impact on children. The Creative Curriculum Development Continuum "when properly used in the context of a program that has taken advantage of the proper training and curriculum implementation strategies, can provide information that has adequate

measurement properties. Factor analysis results are reported that demonstrate construct validity, and norm tables have been constructed using an approximately nationally representative sample” (Lambert, n.d.).

The Creative Curriculum Development Continuum assessment tool is ongoing and data is reviewed three times per year, at the beginning, middle, and end of each program year (fall, winter, and spring). The Continuum assesses children’s growth in four areas of development: social-emotional, physical, cognitive, and language. It outlines the progression of development in each of the four areas with 10 broad curricular goals. These goals have been translated into 50 observable and measurable objectives and are represented by 50 specific items on the Continuum. Teachers make ratings of each child three times during the school year: fall, winter, and spring. Teachers are encouraged to maintain portfolios of student work along with anecdotal records, accumulating multiple sources of evidence that can substantiate the ratings. The process of completing the ratings requires the teacher to identify the developmental level of a specific child on a specific item according to a four-point scale. Each item is phrased in terms of specific behaviors and functional areas, and each of the four levels on the accompanying rating scale is anchored to descriptions of specific examples of these behaviors. The four levels have been identified as Forerunner, Step I, Step II, and Step III. The Forerunner level represents behaviors that may indicate a developmental delay or that a child has not previously been exposed to that skill. Nevertheless, this level represents strengths of the child upon which both future development and instructional strategies can build. Step III represents complete mastery of a particular goal, while Steps I and II indicate the phases of development through which a child will pass on the way to mastery. The Continuum

is, therefore, organized to facilitate, for teachers and families, an understanding of both child development and the progress of specific classrooms and children.

The data I am going to use in this study was generated during the 2006-2007 school year. The teachers assessed student educational level and progress three times per year at the beginning, middle, and end of each program/school year (fall, winter, and spring).

Results

First, I am going to present the students' overall progress for each classroom. Second, I will break the results into four areas of development: social-emotional, physical, cognitive, and language.

At the beginning of the school year (fall assessment), all the Classroom 1 students fell within the range of Step 1, which indicates typical preschool development. During the winter assessment, all the children progressed to the next developmental level (Step 2). At the end of the school year, the spring assessment proved that 95% of the students were ready for Kindergarten (Step 3), with only 5% still remaining at Step 2. Figure 2 displays the data for Classroom 1.

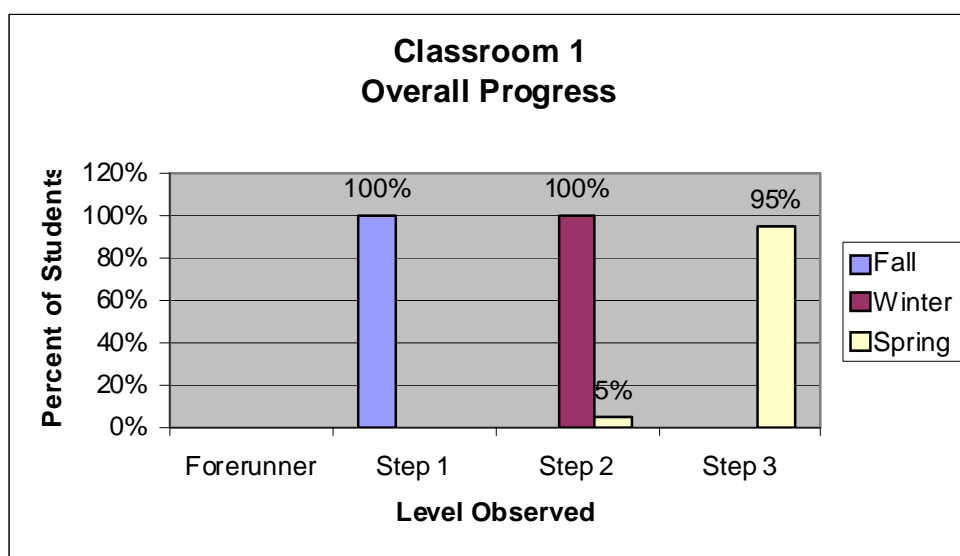


Figure 2. Classroom 1 students' overall progress.

Figure 3 shows the results for Classroom 2. At the beginning of the school year, only 50% of the students were at the appropriate developmental level (Step 1). Nineteen percent of the students were not yet at the appropriate initial level of typical preschool development, and 31% of the students were already slightly ahead of the anticipated level (Step 2). During the winter assessment, 56% of the students remained at Step 1, and 44% advanced to Step 2. The final spring assessment indicates that 75% of the class was ready for Kindergarten, with 25% still remaining at Step 2.

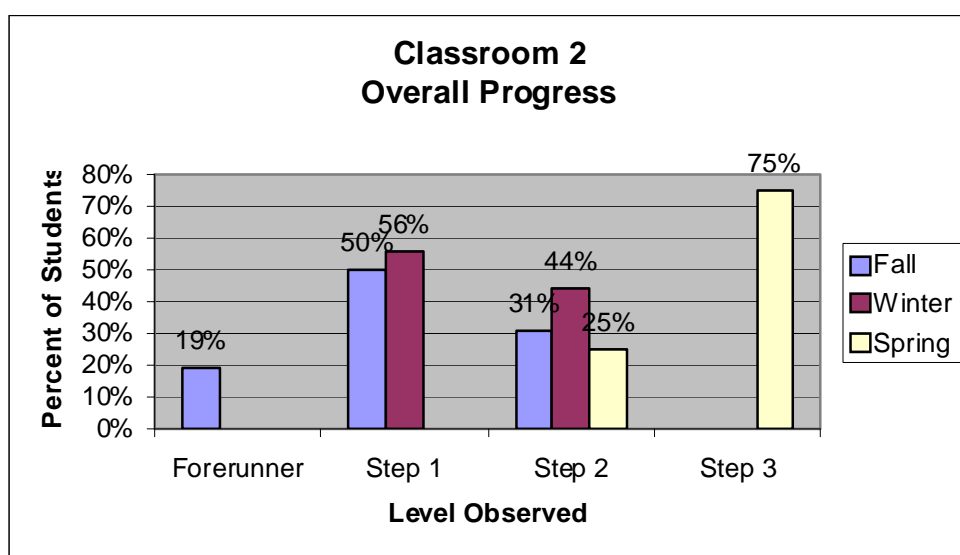


Figure 3. Classroom 2 students' overall progress.

The next two figures, Figure 4 and Figure 5, present students' social-emotional development. Even though the results varied greatly within the two classrooms at the beginning and at the middle of the school year, the end results were quite satisfying. At the end of the year, all of the Classroom 1 students were at the ideal, Step 3, with their social-emotional development. Ninety-four percent of Classroom 2 students were ready for kindergarten, as well, with only 6% still remaining at Step 2.

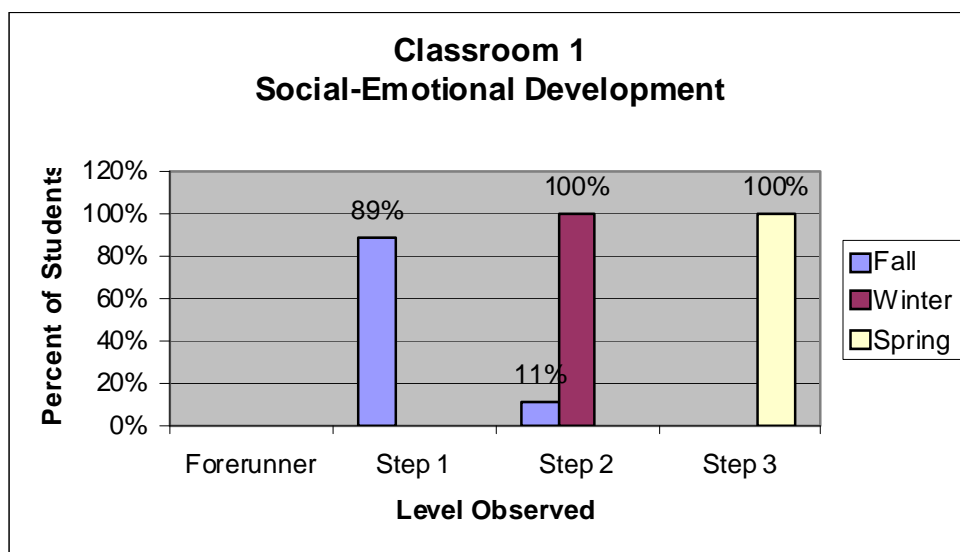


Figure 4. Classroom 1 students' social-emotional development.

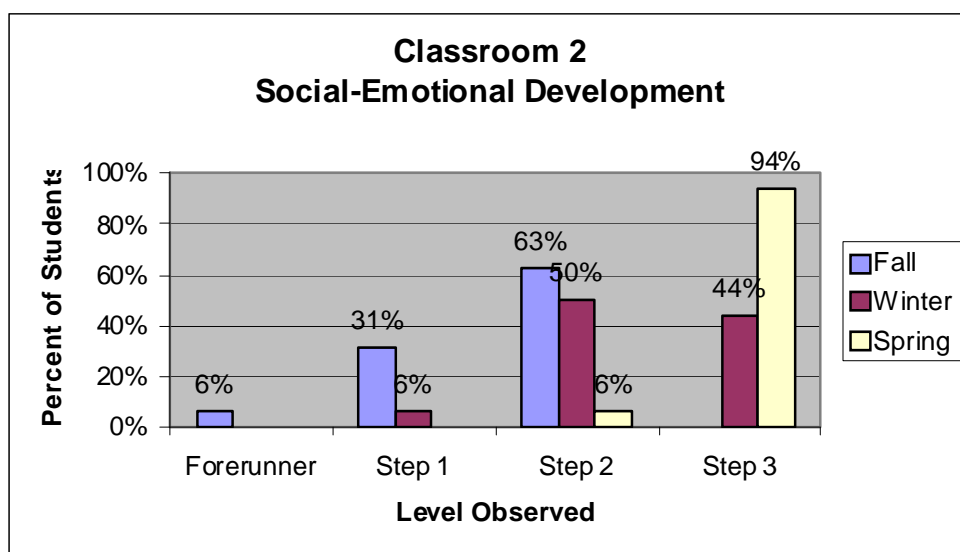


Figure 5. Classroom 2 students' social-emotional development.

Figure 6 displays Classroom 1 students' physical development. At the beginning of the school year, 42% of the students were at Step 1, and 58% were at Step 2, slightly ahead of the expected developmental level. Winter assessment indicated that 53% of the students were at Step 2 and 47% progressed to Step 3. At the end of the year, all the students were at the expected developmental level (Step 3).

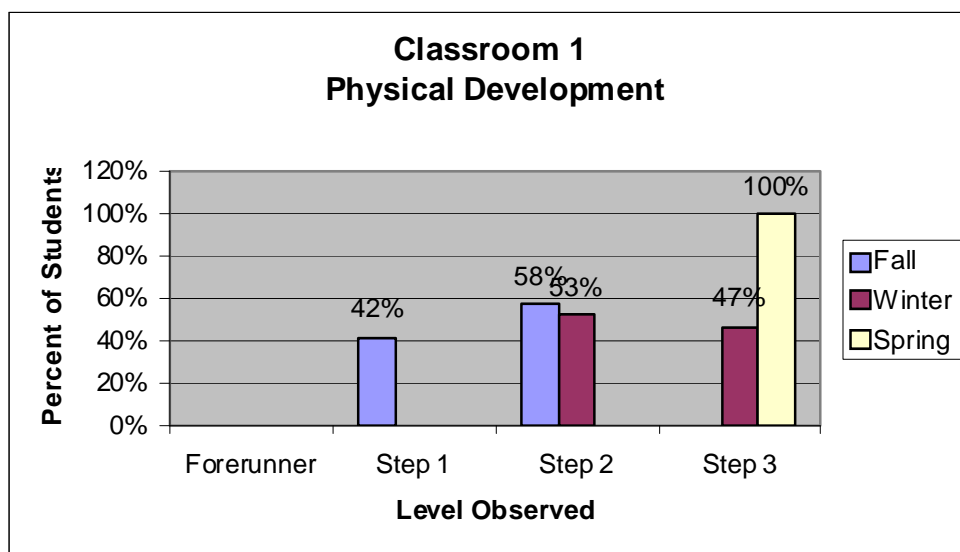


Figure 6. Classroom 1 students' physical development.

Nineteen percent of the Classroom 2 students started the school year with their physical development at the Forerunner level, which indicates they were not yet at the appropriate initial level of typical preschool development; 50% were at Step 1, and 31% were at Step 2 (see Figure 7). At the end of the year, 94% of the students moved up to Step 3, while 6% remained at Step 2.

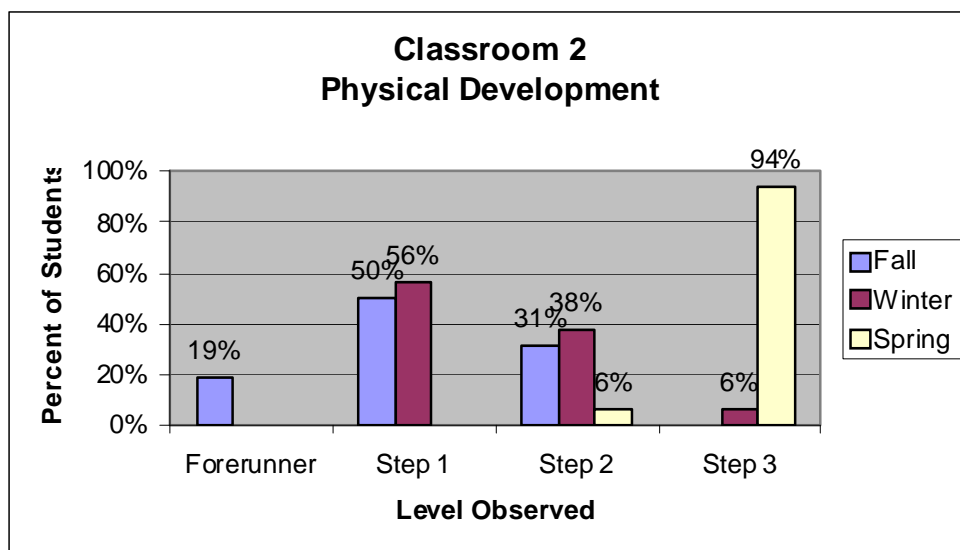


Figure 7. Classroom 2 students' physical development.

The biggest differences in students' achievement between the two classrooms are definitely noticeable in cognitive and language development.

As the data indicates (see Figure 8), 95% of the Classroom 1 students started the school year with their cognitive development at the appropriate level, Step 1, and 5% of the students were slightly ahead of their peers, at Step 2. During the spring assessment, all the students advanced to Step 2. The end of the year assessment proved that 95% of the class was cognitively ready for kindergarten, with 5% still remaining at Step 2.

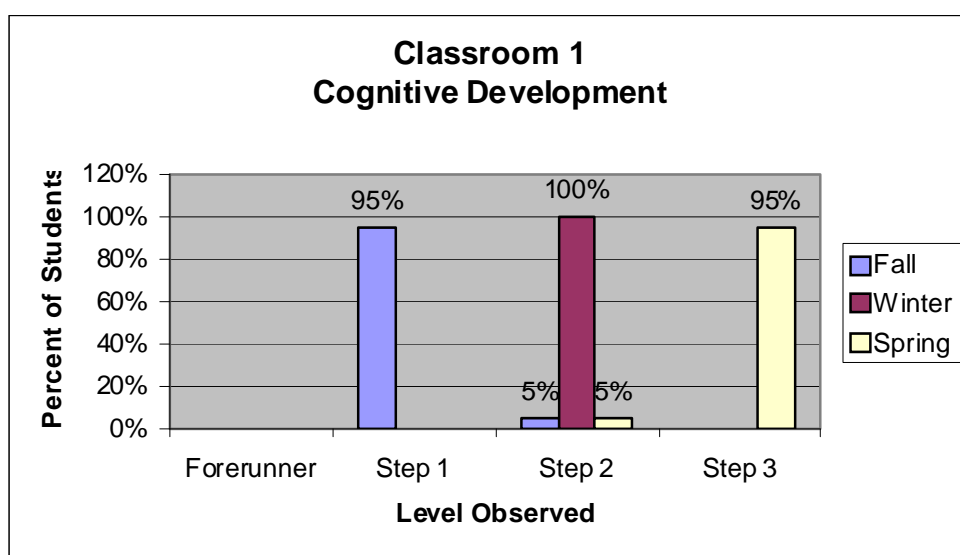


Figure 8. Classroom 1 students' cognitive development.

Figure 9 provides data for the cognitive development of Classroom 2 students. At the beginning of the school year, 31% of the students were at the Forerunner level, 50% at the developmentally appropriate Step 1, and 19% qualified for Step 2. The winter assessment placed 50% of the students at Step 1, 44% at Step 2, and 6% at Step 3. The final, spring assessment verified that 19% of the students were not yet ready for the expected developmental Step 3. Only 81% of the class was cognitively ready for kindergarten (Step 3).

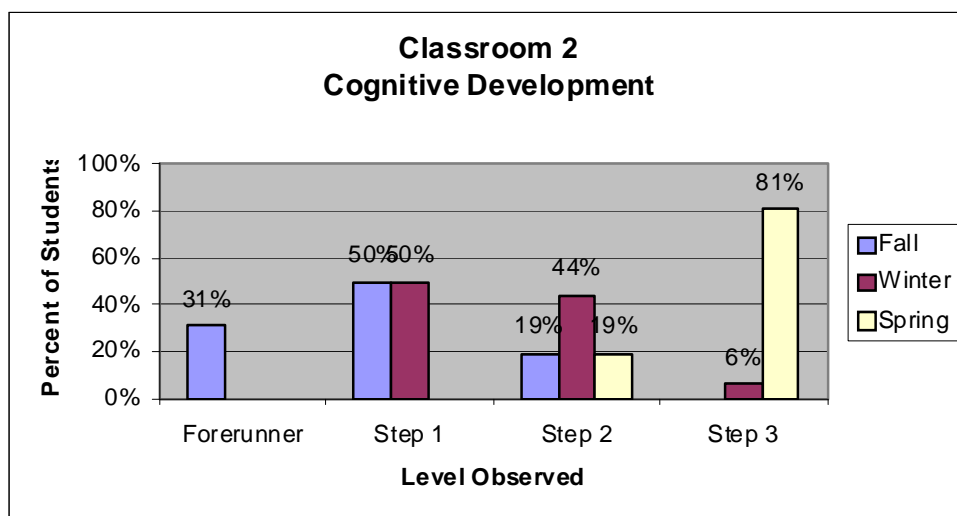


Figure 9. Classroom 2 students' cognitive development.

The last two figures, Figure 10 and Figure 11, represent data for language development. Figure 10 indicates that, out of four developmental areas, language classifies as the weakest area of development for Classroom 1 students. Forty-two percent of the students started the school year developmentally behind, at the Forerunner level. Fifty-three percent of the students were at the developmentally appropriate level, Step 1, and 5% qualified for Step 2. The results of the winter assessment were quite optimistic. Ninety-five percent of the students moved up to the expected Step 2, with 5% still remaining behind at Step 1. At the end of the school year, only 89% of the students were at the anticipated Step 3, while 11% were still not developmentally ready for kindergarten.

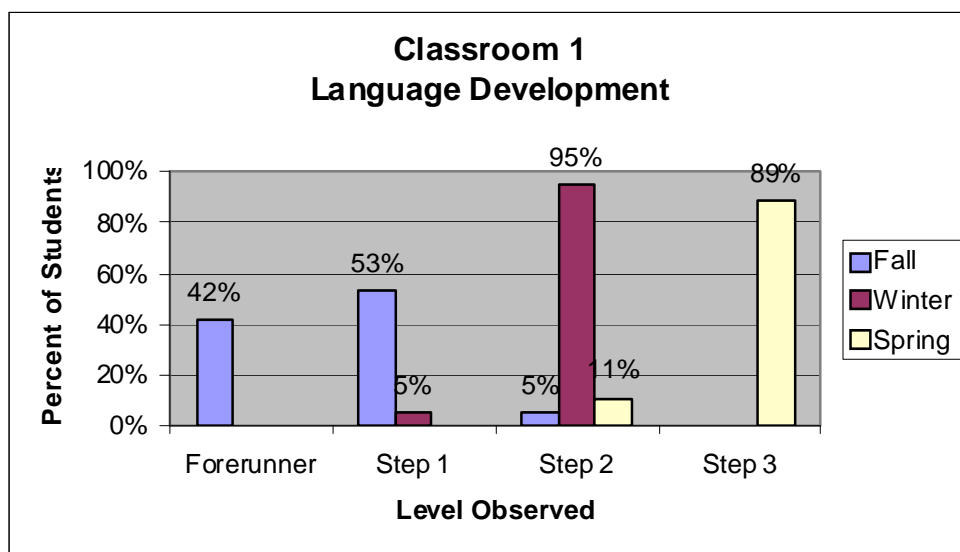


Figure 10. Classroom 1 students' language development.

Language appears to be the weakest area of development for Classroom 2 students, as well (see Figure 11). At the beginning of the school year, 63% of the students were not yet at the appropriate, initial level of typical preschool development. Only 37% of the students were at the appropriate developmental level with their language skills (Step 1). Winter assessment indicated that 50% of the students still remained behind, at Forerunner level, 44% qualified for Step 1, and only 6% of the students were at the anticipated Step 2. The results of the spring assessment were quite disappointing. Only 31% of the students were ready for kindergarten, with 63% still behind at Step 2, and 6% still at Step 1.

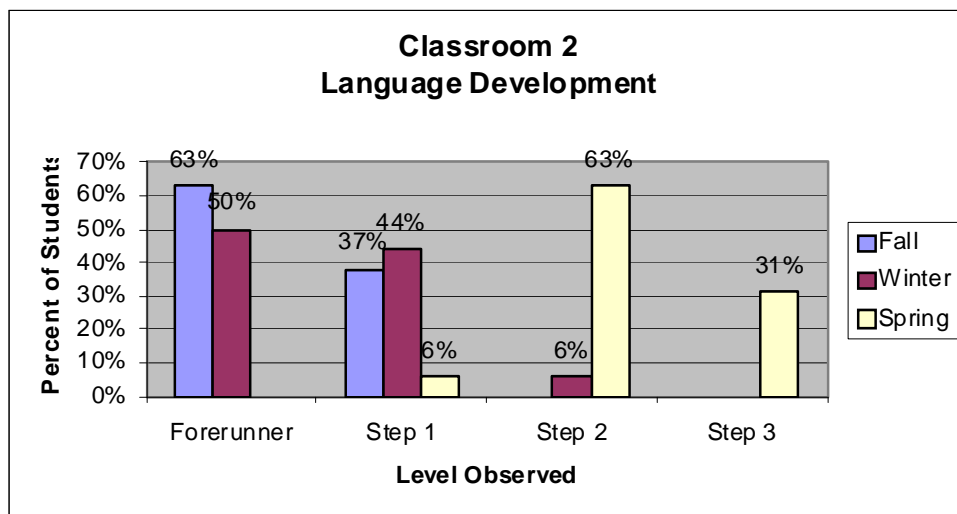


Figure 11. Classroom 2 students' language development.

Conclusions and Recommendations

Conclusions

It is apparent, by looking at the above results, that the students taught by the certified teacher with a bachelor's degree in Early Childhood Education achieved greater educational gains than the students taught by the noncertified teacher with an associate's degree in Early Childhood Education.

A comparison of results from the student assessment data for the 2006-2007 school year proved that Classroom 1 students made significantly better progress across all four areas of development (social-emotional, physical, cognitive, and language) and left Head Start better prepared for school than Classroom 2 students.

The collaboration that Chattanooga Head Start began in 2002 with the Hamilton County Department of Education has had a very positive impact on the educational outcomes of Head Start students.

Recommendations

It is strongly recommended that all Head Start preschool classrooms are staffed by qualified teachers.

An increased number of certified teachers through collaboration with the local school system would be greatly suggested, but, until this can take place, the Head Start program could implement the following to improve the educational outcomes of the students:

- Increase teachers' skill in planning and implementing the curriculum.
- Provide continuous training for teachers regarding the Creative Curriculum Development Continuum assessment tool for increased knowledge.
- Provide continuous training by the literacy specialist on topics pertaining especially to language and literacy.
- Provide student individual quality improvement plans for teachers, with the educational outcomes below the expected norm and/or goal.

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Are Educators Meeting the Needs of all Students?

By Elizabeth Allison Hughie

Education 590, Spring 2007

The University of Tennessee at Chattanooga

*The Institutional Review Board of The University of Tennessee at Chattanooga
(FWA00004149) has approved this research project 07-030.*

Introduction to the Problem

Are you jittery? Do you space out when others talk to you? Do you have a hard time comprehending what you read? If you answered yes to any of these questions, you could have symptoms classified with Attention Deficit Disorder (ADD) or Attention Deficit Hyperactivity Disorder (ADHD), and you would not be alone. There has been a dramatic increase in ADD/ADHD diagnoses in recent years. Students with ADD/ADHD typically have symptoms that appear in early childhood and last throughout their life span. Approximately five percent of school aged children have the disorder (DuPaul & Weyandt, 2006, p. 345), although some research says that up to 10 percent of American school-aged children are affected (Smith & Adams, 2006, p. 102). The disorder is twice as likely in boys. Children that have ADD/ADHD are at a much greater risk for behavioral, academic, and social difficulties, which can lead to an increase in drop out rate (Dupaul, Jitendra, Tresco, Junod, Volpe, & Lutz, 2006). Children as young as age three are diagnosed with the disorder and placed on medication (Barkley, 2006, p. 8).

Children with ADD/ADHD are found to have higher levels of fidgeting, gross motor activity, negative verbal comments, and, in some cases, aggression. ADHD and ADD are two different types of the same disorder. “ADHD is a neurological condition that involves problems with inattention and hyperactivity-impulsivity that are not consistent with the child’s age. ADHD is not a disorder of attention but rather a function of developmental failure in the brain circuitry that monitors inhibition and self-control” (U.S. Department of Education, 2006, p. 2). ADD children have similar characteristics but are not as impulsive and are more withdrawn.

Many children that have ADD/ADHD experience co-existing disabilities. Children with the disorder often experience higher problems in math, reading, and written communication (Anderson, Williams, McGee, & Silva, 1987, p. 69). Currently, ADD and ADHD are the most commonly diagnosed childhood behavior disorders and are treated with stimulants. Stimulants, like Ritalin, are successful in 70 percent of all cases (American Psychiatric Association, 1994, p. 1).

The purpose of this study is to determine whether ADD medications are effective in strengthening a student's comprehension abilities and to determine what teaching strategies are effective for ADD/ADHD learners as an alternative to medicine. This study will take a close look at two different schools in the same district to see if one school is better-equipped at meeting the needs of diverse learners. The correlation between attitude and the amount of training teachers received in dealing with ADD students, will also be compared by school.

ADD learners are in every classroom across the country. Modified instruction and addressing educational needs of ADD students is often neglected by teachers and administrators. Training teachers on how to be better prepared for meeting educational needs of these students is not mandated for schools in our county, and teachers who have not received any training often have less positive outlooks on students with ADD.

Limitations to my research could be obtaining an accurate depiction of the school with not having a large enough sample size. Of those schools participating, there is a possibility that ADD diagnoses are not official, or that they do not have any current students who have ADD.

My research will explore the questions that follow. What are the theories behind the recent rise in ADD medications? Is ADD/ADHD over diagnosed? What medications are used to treat ADD/ADHD and what are the side effects? What teaching strategies are effective when dealing with students with ADD/ADHD? Are some teachers in Hamilton County better prepared and educated in dealing with ADD students than other teachers in the same district? Is there a correlation between site-based training for teachers on how to be more effective in educating students with ADD and teacher attitude?

Literature Review

As stated previously, ADD/ADHD occurs in 3 to 10 percent of all school-aged children (Barkley, 1994). Many of these children are treated with stimulants. Ritalin is the most often prescribed stimulant to help curb symptoms of ADD/ADHD. According to the United States Drug Enforcement Agency (Rae, 2004), there has been close to a 700 percent increase in Ritalin production from 1990 to 1997. Ninety percent of this drug was consumed in the United States for treatment with ADD/ADHD. Dexedrine and Adderall, which are amphetamines and are used to treat ADD/ADHD, have increased by 2,300 percent. Medication and behavioral modification combined is the primary treatment for this disorder (USDEA, 1999). The side effects for these medications can be great. These can include physical, academic, behavioral, and social side effects.

Physical side effects have been known to include problems with sleeping, reduced appetite, weight loss, irritability, stomachaches, and headaches (Doherty, Frankenberger, Fuhrer, & Snider, 2000).

Stimulant medication has helped improve the attention spans of students taking this type of medication. There has been a lack of research showing the long-term effects of taking stimulants. Doherty et al.(2000) found that after elementary children took stimulant medications for 2 years, their academic achievement actually did not increase.

Classroom behavior typically improves when a student starts taking stimulants (Doherty et al. (2000). However, other studies have shown that behaviors can improve without the use of stimulants (Abramowitz, Eckstrand, O'Leary, & Dulcan, 1992). Other studies have shown that the combination of the two shows the best results (Smith, Thomas & Adams, 2006).

Social interactions can also be improved through stimulants. A study conducted by Landau & Moore (1991), concluded that students who were taking stimulant medication behaved more appropriately in social situations than those who were not taking medication. These students were more able to sit still, focus and get along with other children (cited in Nelson, Rinn, & Hartnett, 2006).

According to Doherty et al., “approximately two to 11 percent of all children who are diagnosed with ADD/ADHD are taking stimulant medication. Out of these students, 35 percent said that they felt sleepy after taking this medication, 42 percent said they had problems sleeping at night, 58 percent said that they did not feel like themselves and 35 percent said they did not like to eat lunch after taking the medicine (2000, p. 49).

What is a stimulant? There are many definitions of a stimulant. According to Britannica Concise Encyclopedia a stimulant is:

Any drug that excites any bodily function; usually one that stimulates the central nervous system, inducing alertness, elevated mood, wakefulness, increased speech and motor activity, and decreased appetite. Their mood-elevating effects make some stimulants (e.g., amphetamines, caffeine and its relatives, cocaine, nicotine) potent drugs of abuse (*see* drug addiction). Ritalin, prescribed for attention deficit disorder in children, is a mild stimulant. (2005, p. 1)

According to the Department of Defense, stimulants are, “Controlled drugs that make the user feel stronger, more decisive, and self-possessed; includes cocaine and amphetamines” (*Military definitions*, n.d., ¶ 697).

What drugs are students prescribed? The following chart illustrates the name of the drug, the class to which the drug belongs, and the age at which the child can begin use of the drug:

Trade Name	Generic Name	Approved Age
Adderall	Amphetamine	3 and older
Concerta	Methylphenidate (long acting)	6 and older
Cylert	Pemoline	6 and older
Dexedrine	Dextroamphetamine	3 and older

Dextrostat	Dextroamphetamine	3 and older
Focalin	Dexmethylphenidate	6 and older
Metadate ER	Methylphenidate (extended release)	6 and older
Metadate CD	Methylphenidate (extended release)	6 and older
Ritalin	Methylphenidate	6 and older
Ritalin SR	Methylphenidate (extended release)	6 and older
Ritalin LA	Methylphenidate (long acting)	6 and older

(Barkley, 1996, p. 2).

Why are parents lining up to put their children on drugs that are a milder version of cocaine and amphetamines? Clayton (2006) points out that parents are pushing for pills to increase academic performance, even when their child is not diagnosed for ADD/ADHD. This is also known as academic doping. The long terms effects of this are unknown, but a study done by Harvard Medical School (McLean Hospital, 2004)

suggests that children who take prescription stimulants and really do not have ADD/ADHD are more likely to have depressive symptoms later in life.

There are also issues of abuse with prescription stimulants. It is widely known that some children abuse these drugs to get high. Some children crush the drug and snort it, or even inject it (Clayton, 2006). A study conducted at the University of Wisconsin at Madison (2002) concluded that one out of every five students acknowledged having taken attention-deficit drugs without a prescription. Adderal, and Ritalin, alike, increase a person's ability to concentrate rather they have an attention disorder or not (Nichols, 2004).

There are many different theories of why ADD/ADHD occurs. According to Madrona, (2003, p. 241) "some researchers believe that persons with ADHD have an unusually low rate of activity in parts of the brain areas responsible for motor control and attentiveness. The source of these neurological defects remains uncertain, but some believe that it is genetic. Some studies show a link between ADHD and the Dopamine transporter gene. A study by the Biederman Group in Massachusetts shows that, "10-35 percent of immediate family members of children with ADHD are likely to have the disorder. The risk to siblings is approximately 32 percent" (cited in Smith & Adams, 2006, p. 112).

According to Madrona (2003), there are also environmental theories on the origin of ADD/ADHD. Some pregnancy and birth insults may affect the developing brain. Some studies show that alcohol during pregnancy is linked to ADHD. Still others argue that stress and poor nutrition during pregnancy can cause babies to develop problems

later. Other studies show that smoking, and a high sugar/high carbohydrate diet during pregnancy can also relate to behavioral problems. An Associated Press article, published in April 2000, explores the relationship between smoking during pregnancy and ADD. Smoking lowers the blood oxygen level, which is critical in fetal development, especially the development of fetal brain cells. High carbohydrates and high sugar diets have also been known to attribute to the lowering of blood oxygen levels. Other environmental factors, such as low birth weight, too little oxygen at birth, and exposure during pregnancy to a number of toxins including alcohol and cocaine, have also been linked to ADD in some studies (Madrona, 2003, p. 240). A study done by researchers at Yale & The Harvard Addiction Research Foundation (The Healing Center On-line, 2003), found that, out of 298 cocaine addicts, 35 percent had a childhood history of ADHD, and Harvard Medical School reports that adults with ADHD are three times more likely to abuse drugs and alcohol than those without the disorder. Possibilities of this theory could be supported by a topic the NIH addressed in November of 2000 of how Ritalin and Adderal mimic cocaine, and this may be the reason that those with ADHD are more likely to become addicted to cocaine.

Some argue that nutrient deficiencies equate to learning disabilities. “These include: Calcium deficiency, high serum copper, iron deficiency, magnesium deficiency, malnutrition, dyslexic children and iodine deficiencies have been linked to learning difficulties” (Madrona, 2003, p. 3).

According to Harman (2006), the traits of ADD/ADHD were actually passed to us from our hunter and gatherer ancestors. The traits of ADD/ADHD were actually once

beneficial to our ancestors. These hunters were better suited to notice differences in their environment and their more impulsive behavior gave them bravery and more energy to hunt. He believes that this ADD and ADHD behavior is natural, and that society wants children to be compliant, even if it means drugging them.

Teachers can do a variety of actions to help promote focused learning in their classroom for students who have been diagnosed with ADD/ADHD. Routine is extremely important and students need to know what to expect. Helping students to stay organized is also important. This should also be reflected in the classroom. School supplies should be labeled, and put away in the same spot every day. Homework books and organizers should be encouraged and implemented. Verbal praises for good behavior should be carried out. Close contact with parents can help students with ADD. This can create positive communication that clue teachers in on changes in schedule, general mood, or attitude changes. Parents know their children best, and their advice on effective approaches can be valuable. Teachers can give physical classroom tasks to students who have extra energy. Students with ADD/ADHD can become the classroom helper.

Methodology

This study will compare two schools in the same district to discover if a discrepancy exists on training teachers on the topic of ADD students. Attitude and training will be looked at collectively, then compared to on-site training received per school.

A questionnaire that combines short answer, rating scales, and yes or no responses will be the tool to assess this research. The questionnaire is comprised of 16 questions, and does not ask for any personal or other information that could be used to seek out the identity of those participating. Respondents will have adequate space to write their short answer questions or to add comments.

The questionnaire is designed to identify the ratio of ADD students per classroom and to see if the participant has received training from their school administrators on how to effectively teach ADD students. The next portion of the survey asks for specific, effective strategies the teacher has implemented. The last portion asks participants to use a rating scale to assess attitudes of themselves, administrators, and their co-workers toward ADD students.

The results will compare the two schools to see if there is a correlation between attitude and on-site training provided for faculty. Methods of teaching modifications and medicinal effects will be classified as positive or negative. The study will take place over a semester. The different schools and procedures are described in the following section.

Data Collection and Results

Copies of a single questionnaire were distributed among the teaching faculty and administration of two Hamilton County Elementary Schools. One school (school A), is a magnet school that is located close to UTC and focuses on teaching methods that address the needs of each child's unique learning style. The second school (school B), is a rural

school. Administrators at this school were implementing instructional and curriculum changes during the time of this study. The schools varied greatly in student ethnicity.

Invited Participants

The survey was used at two different schools within the same district. The teaching faculty and administration were asked to participate in the research. The questionnaire was distributed into the office mailbox of all teachers and administrators. The faculty member was asked to complete the questions within a 2-week period. A secured and labeled box was placed under the mailboxes for the completed questionnaires. The procedure and survey were identical at both schools.

The Method and Questions

The questionnaire was designed to compare attitudes of faculty members toward on-site training for addressing needs of students with ADD between the two different schools. The questions in the first part of the survey were used to identify the ratio of ADD students to their non-ADD peers. Questions involving instructional interruptions were asked next. The respondents were asked to describe specific behaviors that interrupt their instruction and the learning of their other students.

The respondents were then asked to describe specific strategies or modifications in teaching instruction that they have implemented for those with ADD. Respondents were then asked if their school system or administrators provided them with literature or training suggestions on how to best modify instruction to address the needs of these students.

In the next section, respondents were asked to identify the number of students who take medication for ADD. Respondents were asked to describe any changes in student behavior after taking ADD medication.

In the last set of questions, respondents were asked to rate the outlook of their co-workers and administrators on a scale of one to five, with one being an extremely negative outlook and five being an extremely positive outlook.

A copy of the questionnaire used is in Appendix A.

The Response

At school A, one respondent completed the questionnaire during the 2-week cut off, so the questionnaire was distributed a second time, with no changes made to the content. This was done to receive additional data to conduct the study. This increased the completed questionnaires to three. At school B, teacher response was immediate and surveys were submitted within 3 days of distribution. School B had five surveys completed, bringing the total to eight.

Results

All respondents had students in their classrooms who have been diagnosed with ADD. The number of ADD students varied from two to seven among classrooms. The total number of all students in each classroom varied from 17 to 22. School A had a mean ratio 5:18 and school B had a mean ratio of 3.4:19.6. There were less total participants at

school A than school B. However, the presence of ADD students represented by the survey was greater. (See Figure 1.)

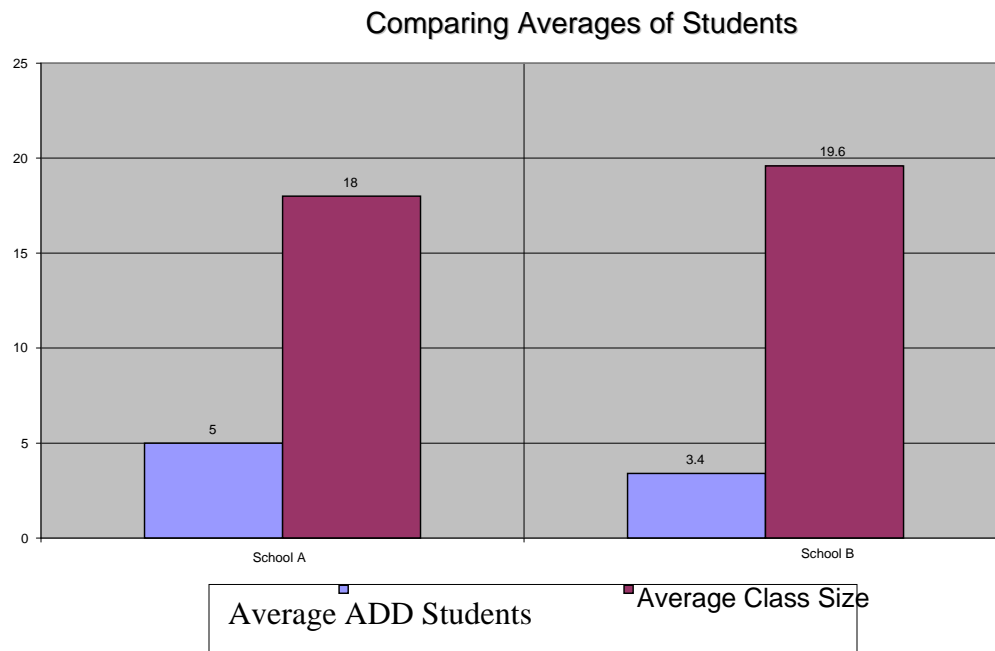


Figure 1. Comparing classroom averages of students with ADD.

All respondents replied that at least one of their ADD learners (if the teacher had more than one ADD learner in their class) interrupts classroom instruction and the learning experience of their peers on a daily basis. When asked how their ADD students disrupt instruction, all respondents replied that blurting out was an interruption. Five respondents replied that they often had to repeat directions for these students to the point that it is disrupting the classroom. Four respondents noted that excessive movements were a cause of instructional interruption. One respondent said that their ADD learner (s) disrupt instruction by making noise and talking out of turn.

All respondents indicated that they have teaching and behavioral management strategies in place to deal with the interruptive behavior on behalf of the ADD student. When asked what specific strategies were implemented, the responses varied greatly. The individual responses that follow are grouped by school A or B. Seven participants stated their teaching modifications were successful and one participant indicated their strategies were successful sometimes. The individual who wrote in, "sometimes" is indicated below.

School A: Individual one responded that they take a positive approach by encouraging all positive behavior, instead of relying on a system that punishes poor behavior. Individual one noted that, instead of using a color scale or a stick system, where students are told to pull a stick or move a color resulting from bad behavior. The participant added that positive behavior should be the focus at school, and bad behavior should not be given extra attention, unless the bad behavior has the potential to harm others in the class. Individual two indicated a variety of successful modifications. The use of verbal and nonverbal signals to change behavior, provide additional tasks or "important roles," reduce student waiting time for asking questions or one-on-one time with the teacher, move the students with ADD to the front of the room to prevent distraction, let them handle special tasks to expel extra energy, partner them with well-behaved students, and provide clear and precise instructions, were all helpful. Individual three stated redirection, ignoring, time away from group, and loss of privilege, were effective ways of reducing bad behavior.

School B: Individual one stated that separation and learning and behavior contracts were helpful. Individual two indicated that time for shouting out answers is provided and movement is incorporated into most of their lessons. Individual three stated assigned seats, individual work as opposed to group work assignments, and student work accountability, were helpful. This participant also indicated that these methods were only successful in behavioral management “sometimes.” Individual four stated that assigned seats, providing a stress ball at the student’s desk to keep their hands busy, and partnering ADD students with students that provide a positive student influence, are methods that are effective in class. Individual five indicated that rewards and punishments were granted to the entire class, based on behavior as a group, as opposed to individual behavior. The respondent added that positive peer pressure is successful in their class. This respondent said that behavioral expectations should be made prior to starting a lesson, and that a model of work product should be produced and created during the instructional element of the lesson. Successful teaching modifications that were listed on more than one survey included assigned seats, stating clear lesson and behavioral objectives, independent work, paired group work with a well-behaved student, and positive recognition when good behavior is demonstrated. The mode strategy was pairing students with partners that would denote a positive influence on their partner’s behavior.

Question 9 was a two-part, yes or no question, regarding training received on effective ways to teach to ADD learners. In school A, all three participants had received training. All participants indicated that training was given by persons affiliated with the school in which they currently teach. None of the participants in school B received

training from persons affiliated with their school. Four of the respondents indicated they had received training from a source not affiliated with their school. (See Figure 2.)

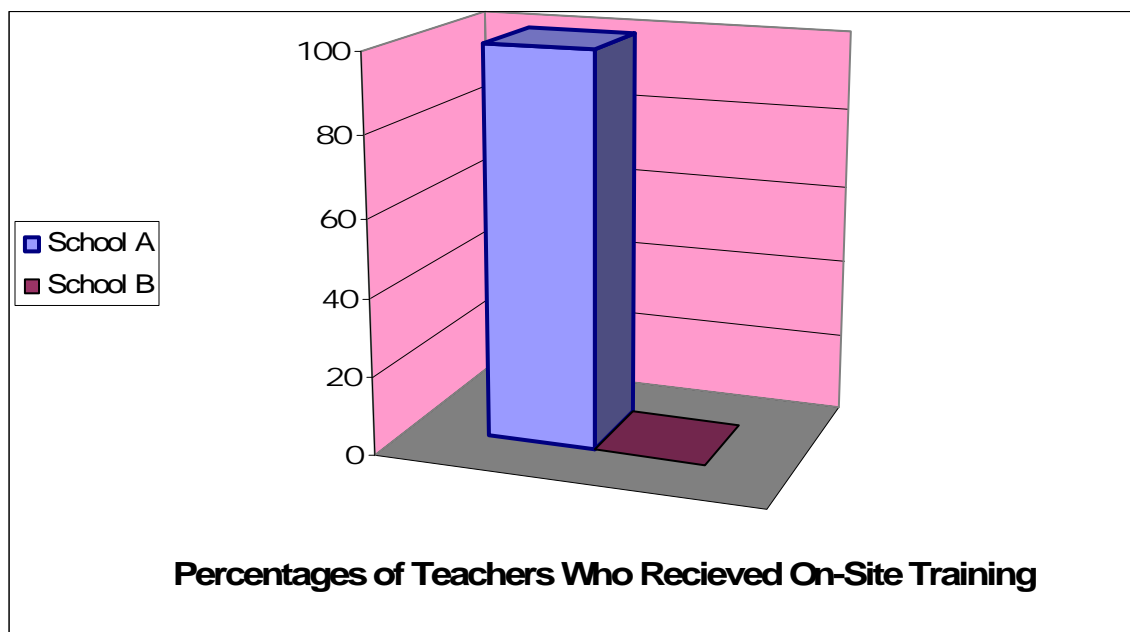


Figure 2. Percentages of teachers who received on-site training.

Questions 10 and 11 are about ADD medication. Question 10 asked, Did you receive any literature from persons affiliated with your school regarding students who are being treated with medications for ADD/ADHD? One hundred percent of School A respondents indicated that they had received literature from persons affiliated with their school regarding students who are taking medication for ADD. Two respondents from School B indicated they had received literature about ADD medication. The remaining three indicated they had not received literature.

Statements of observable effects of medication from participants in school A were as follows: Individual one stated that medication should only be used as a last result and

that a teacher-implemented behavioral strategies should be implemented before going to a medication alternative. Individual two stated that the effects of medication were observed by the students exerting more control in their actions. Individual three stated the effect of medicine on ADD students was observed as positive on student behavior, less interruptions, more focused, higher work completion, and improved comprehension of concepts. Individual three stated that positive changes in behavior were observed and communication levels increased.

School B respondents all indicated that medicinal effects were observed in students because their attention span seemed to increase and positive changes occurred. Individual one said students appear to better control impulsiveness. Individual two said that movement was better controlled. Individual three stated that the medication had a calming effect; children seem to be more able to stay on task and had better control of their emotions. Individual four stated the medication effect was positive, creating less interruptions, more focus, and retention. Individual five stated that students were able to sit still and pay attention.

The remaining section of the questionnaire was to rate attitude perception of themselves, co-workers, and administration, with regard to students who have ADD. Participants in school A had a one point higher ranking in overall attitude perception of children who have ADD in their schools. School A had a mean of 4.333, while school B had a mean of 3.4, on a five-point scale. One represented an extremely negative outlook and five represented an extremely positive outlook. School A had an overall higher rating

of perceived positive attitude than did school B. School A participants had a higher rating in each of the three categories.

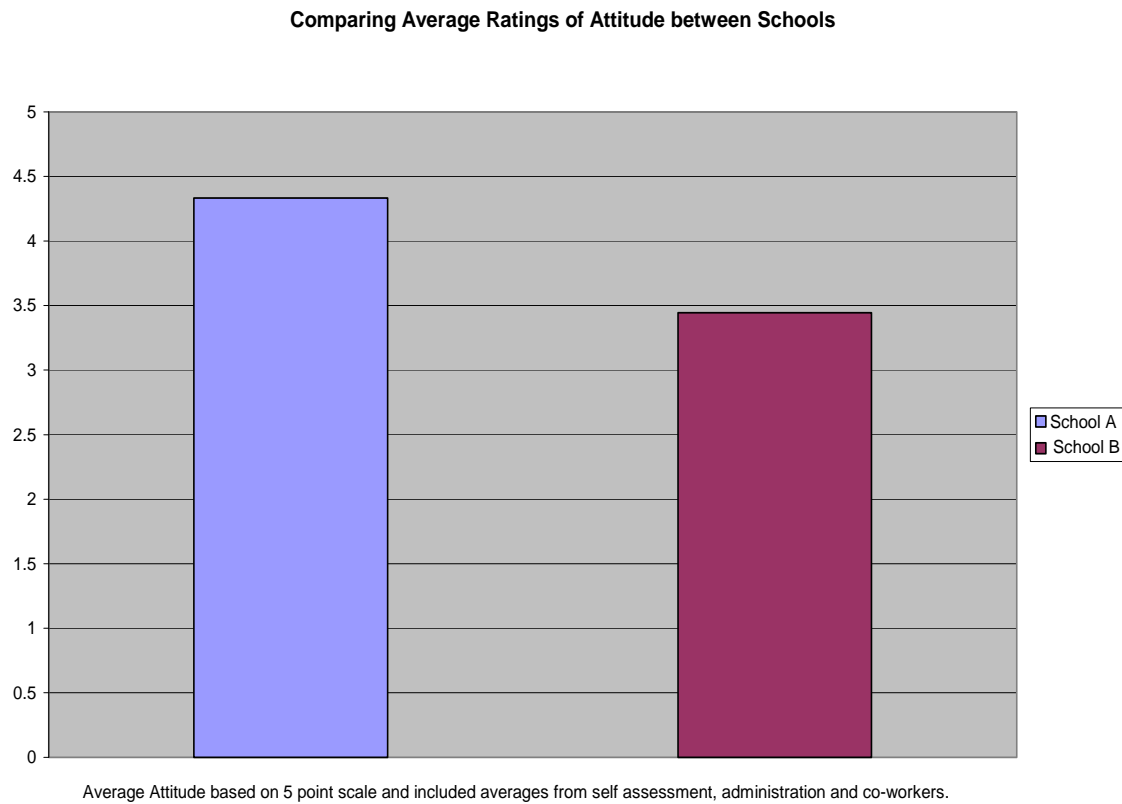


Figure 3.

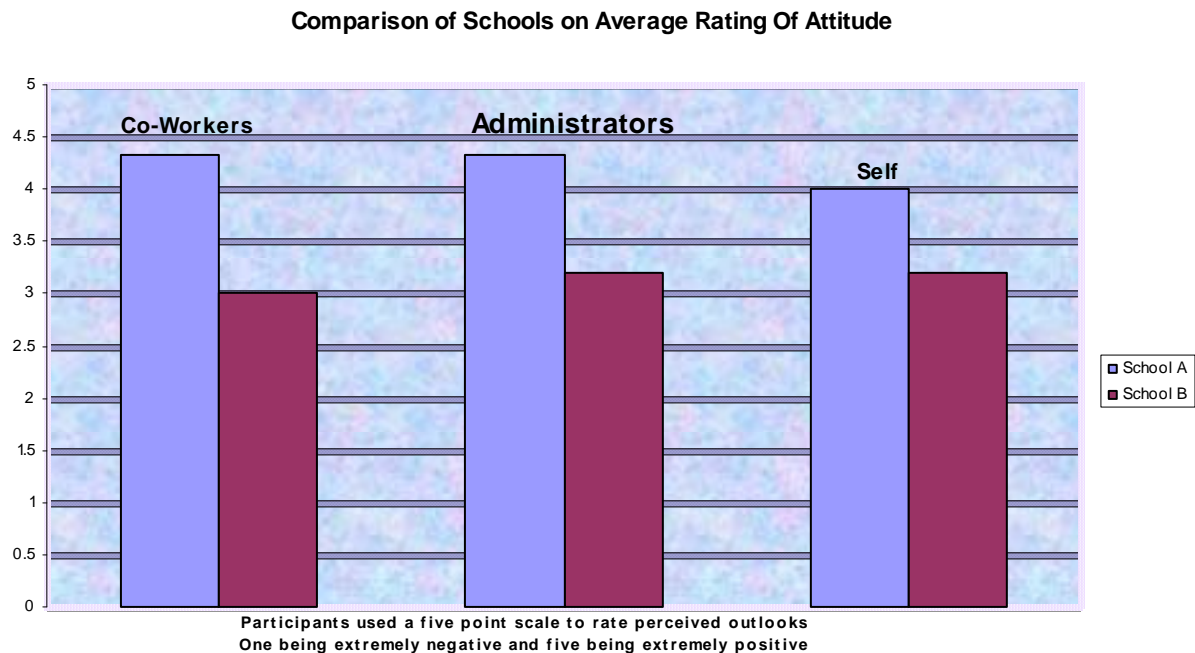


Figure 4.

Conclusions and Recommendations

Conclusions

There are many theories on the causes of ADD and there is wide speculation if the disorder is actually a true disorder in young children. The production of prescription drugs that are used to treat ADD has risen dramatically in the United States in the last 15 years. Children as young as 3 years old are being prescribed stimulants by their pediatricians to correct behavior that appears to be unfocused or hyperactive. The decision to medicate children is left up to the parent, but teachers and doctors can have a high degree of persuasion in this decision. There are no long-term studies to show the affects of taking a stimulant daily for a long period. Unfortunately, children prescribed medication used to treat ADD will often always be prescribed this sort of medication

throughout their entire life. No long-term studies have been completed on the effects of medication used to treat ADD, yet this medicine is being prescribed, and, in some cases, teachers are asking parents to discuss it with their child's pediatrician.

Teachers do have an impact on whether their student is a receiver of medication. Parental communication between the parent and the teacher seems to be lacking in our school system. Most teachers will have the experience of an ADD learner in their classroom. It is the job of the teacher to create a positive learning experience for all students. Educational training for teachers is needed to create a positive environment that meets the demands of all students. Teachers in Hamilton County are not trained uniformly on meeting the needs of all students. Some teachers are better prepared than their counterparts, working in at a different location, with ways to effectively deal with students who have ADD. There is a correlation between training implemented on-site and overall attitude of school faculty. The school that had on-site training had a better perception of students with ADD. Educating faculty on instructional modification methods for students with ADD seems to create understanding and a sense of partnership.

Recommendations

Teachers can use a variety of techniques to encourage a positive response from the student, including making their student a helper, giving them tasks that require movement, rewarding the positive actions instead of focusing on the bad, staying organized, and creating a routine. All are ways to help students who have ADD. The use of technology in the classroom could create a new learning presentations for students with ADD to retain student focus.

Teaching modifications should be explained by staff members to their employees working with students. Providing staff members with an in-service day would be a great time to discuss student needs in the classroom. There should be specific strategies in place for instructional behavior modifications so that students and teachers are maximizing educational time. Uniform teacher training on meeting the needs of students should be implemented on a national level to create a positive classroom environment for all students. A more naturalistic approach should be taken by teachers, instead of encouraging medication. Medication should truly be used as a last resort.

Long-term studies are needed to show the effects of taking stimulants on a daily basis, especially when given to children. Funding a long-term study would be expensive. However, this area is of great interest to many large companies, which fund grants in this field. Grants.gov is an excellent site for finding grant money for pursuing additional research.

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Appendix A

Questionnaire for Teaching Staff:

1. Do you currently have students in your classroom who are hyperactive or have been diagnosed with ADD/ADHD? Circle YES or NO

If YES, please CIRCLE the number of official diagnoses and the number of hyper-active students that you suspect show symptoms of ADD/ADHD.

1 2 3 4 5 6 7 8 9 10 11 12
 13 14

2. How many students do you have in your class?

3. If you have students who are hyperactive or have been officially diagnosed, do these students interrupt classroom instruction? Circle YES or NO

If so, how?

4. Have you observed students that have been diagnosed with ADD/ADHD or are hyperactive interrupt the learning process for other students in your classroom? Circle YES or NO

5. Do you have a specific strategy or modifications in place to address issues of classroom interruption by hyperactive/ADD learners? Circle YES or NO

If YES, what are they?

6. If you have modifications or specific strategies in place, have these been successful for you? Circle YES or NO

- | 7. Are there any changes in these strategies or modifications that you think could be made to make instruction and classroom management easier for both you and your students in the future? Circle YES or NO

If YES, What are the modifications that you believe could be more successful?

- | 8. If you do not have teaching modifications in place to meet the needs of students with ADD/ADHD, please state the reason why. (i.e. lack of resources to educate teachers on the disorder, belief that all students should be taught on uniformly)

- | 9. Have you received any training or suggestions about teaching with ADD or hyperactive learners? Circle YES or NO

If YES, was this training or suggestions made by persons inside your school or persons affiliated with your school that you are currently teaching in? Circle YES or NO

- | 10. Did you receive any literature from persons affiliated with your school regarding students who are being treated with medications for ADD/ADHD? Circle YES or NO
- | 11. Of those students you have currently or past that take ADD/ADHD medications, what has been your observation regarding changes in the students after taking this medication?

- | 12. Do you feel that other teaching professionals within your school have a positive outlook on teaching modifications to meet the needs of a diverse learner? Circle YES or NO
- | 13. On a scale of 1 to 5, one being an extremely negative outlook and 5 being an extremely positive outlook, please rate other teaching professionals on your grade level positions and attitudes about students with ADD/ADHD.
Circle the appropriate number:
1 2 3 4 5
- | 14. On a scale of 1 to 5, one being an extremely negative outlook and 5 being an extremely positive outlook, please rate your administrations attitudes and positions in regards to students with ADD/ADHD.
Circle the appropriate number:
1 2 3 4 5
- | 15. On a scale of 1 to 5, one being an extremely negative outlook and 5 being an extremely positive outlook, please rate your personal attitude toward students who have either been officially diagnosed with ADD/ADHD or toward to students that appear to have very similar symptoms as those officially diagnosed with ADD/ADHD.
Circle the appropriate number:
1 2 3 4 5
- | 16. Please add any additional comments here:

Can Flying Objects Induce Identifiable Respect?

Carl Kiefer

Education 590, Spring 2007

The University of Tennessee at Chattanooga

The Institutional Review Board of The University of Tennessee at Chattanooga (FWA00004149) has approved this research project 07-031.

Introduction to the Problem

Presently, I am coaching a coeducational Ultimate Frisbee team at a private high school. The team participates in a 12-team league established by the Chattanooga Department of Parks and Recreation in conjunction with the Chattanooga Flying Disc Club (CFDC), of which I am a member. In the most recent league, we had 17 male participants and 5 female participants. The school administration, faculty representative, student participants, and I comprise the action research group for this study.

Ultimate Frisbee is a coeducational team sport that teaches resolution skills. A game of Ultimate Frisbee involves two teams of seven members each, on a field that measures 70 yards in length by 40 yards in width, with 25-yard end zones on both ends. The format for coeducational Ultimate Frisbee is either a four/three or three/four ratio of males to females; offense decides the ratio. Ultimate Frisbee is a noncontact sport in which the players, themselves, act as officiators. All players are responsible for knowing the rules of the game and are required to regulate their play by the concept of “spirit of the game.” This concept holds that, if a player knowingly commits a rules infraction during the play of a game, he or she is responsible for admitting to, or “calling,” a foul on himself or herself. Fouls may also be called by players who believe an infraction has been committed against them. Should a dispute occur, in which a player disagrees with the call on the field, he or she may “contest” the call and the disc will remain in the possession of the team that had it prior to the original call. Otherwise, the possession of the frisbee will be maintained by the team of the player who was fouled, and the opportunity for that team to score will have been preserved during that possession.

Being a coeducational sport, and one which requires self-officiating, Ultimate

Frisbee provides its participants a unique opportunity to experience a high level of sports integrity, and thus a high level of self-esteem, as well as an opportunity to display respect for one's teammates and opponents. Coeducational Ultimate Frisbee is an excellent device for teaching respect of others and self in an arena that closely resembles real-life situations in the general public. The sport, like the world we live in, has both male and female participants. The sport requires all disagreements to be settled in a nonviolent, nonthreatening way by its participants. Like other team sports, success occurs when the team, with a common goal, works together in order to achieve such a goal. As a coach, it is my responsibility to make sure each participant has knowledge and understanding of the rules of the game, and adheres strictly to those principles.

An interesting point about Ultimate Frisbee is that, after every game, it is customary for each team to cheer the opposing team. This is usually done in the form of either song or poetry, and is intended to point out those aspects of the other team's game that are found particularly remarkable or praise-worthy, be they the team's athleticism, "spirit," or just plain, good fortune. Another custom of the sport is that, at every tournament, a "Spirit of the Game" trophy is awarded to the team that demonstrates the highest level of sportsmanship and respect for their opponents. This award is as coveted by participants as much as the winning of the tournament, itself.

The Problem

Over the years, I have participated in a number of sports, both as a player and a coach. I have witnessed varying degrees of sportsmanship exhibited by players, coaches, and fans. As a coach and a participant of a sport that prides itself on being highly competitive, while maintaining a high level of respect towards other players, I want to

impress upon those that I coach the need to maintain the highest level of integrity while participating. A strong correlation exists between self-respect and respect for others (see Review of Literature below). In turn, participation in team sports and other athletic endeavors has been demonstrated to improve the levels of self-concept among players.

The problem this research intends to address is the widespread lack of respect, and low self-esteem and low self-efficacy, among American high school students. Abiding by the “spirit of the game” is a tenet of Ultimate Frisbee, and is required of its participants in order for the sport to be successfully played. Integrity, self-respect, and respect of others are paramount to the success of the sport, and to life, in general. For this reason, I intend to study the effects of participation in the sport, and determine the extent to which the sport serves high school participants as an avenue toward higher self-esteem and self-efficacy. Not only are the high school participants new to the sport of Ultimate Frisbee, but, to the best of my knowledge, no other extracurricular, coeducational, self-officiated team sport exists in the local public school system; thus, this will be an excellent opportunity to collect, interpret, and analyze the sport’s effects on the character of its participants.

Review of Literature

Disregard for the feelings (physical and emotional) and opinions of others are seen at every age and within, as well as throughout, every social echelon. We see it on the streets and at social gatherings. It is present in our cultural institutions, takes place at all levels of government, and happens in our neighborhoods and homes. A lack of respect displayed between members of the opposite sex is particularly disturbing. It was not too long ago when showing respect for a member of the opposite sex was the cornerstone of

courteous behavior. Among today's youth, disrespect manifests itself, to a great extent, in our public schools. Whether or not it begins there, efforts to instill the notion of, and belief in, self-respect and respect for others can, and in many circumstances should, take place within our education system. Such efforts, according to Howard, Berkowitz, and Schaeffer, are known as "character education" (2004, p. 189). Character is "knowing the good, desiring the good, and doing the good" (2004, p. 190). In response to the question: "Can [character education] be taught [in schools]?" Howard et al. indicate that, through the "cognitive-developmental approach," the "caring approach," and the "narrow approach" of "traditional character education," the answer is yes (2004, p. 190).

Lack of respect for self and others among the school-aged youths of our society is a concern of mine as I embark on a career in secondary education. This action research will attempt to strengthen relationships between the sexes by concentrating on exhibiting respect for others. Exhibiting a general sense of respect for oneself or for the thoughts, feelings, and beliefs of others is referred to, by Gendron, Royer, Bertrand, and Potvin, as an example of "social skills" (2004, p. 249). "Weak social skills...limit [students] in their ability to establish satisfying social relationships and stay away from antisocial behaviours" (2004, p. 250). Lack of respect for others, is the manifestation of a "behaviour disorder" (2004, p. 249).

Behavior disorders have adverse effects on academic, as well as nonacademic goals and outcomes, according to Marsh and Kleitman in their study on the effects of athletic participation among high school students. The researchers claim "athletic participation may have positive effects on life skills and also benefit academic accomplishments" and that "no evidence suggests that athletic participation has negative

effects” (2003, p. 207). Playing organized team sports tends to heighten “social and academic self-concepts” among participants (2003, p. 208). Marsh and Kleitman indicate that an individual’s athletic ability, socioeconomic status and, especially, gender were significant factors to be taken into consideration when evaluating a student’s perception of self.

Respect for one’s self, or self-esteem, is necessary in order to experience and exhibit respect for others. Being able to identify and appreciate oneself allows an individual to better identify with, and appreciate, others. Todd and Kent studied the “development of self-perception” in a sample of high school athletes and made comparisons with respect to gender and class level (2003, p. 660). They suggest that high self-esteem correlates directly with a student’s “high...leadership potential” and her ability to identify and appreciate the needs of others (2003, p. 661). Using a modified version of the Self-Perception Profile for Adolescents (SPPA), Todd and Kent obtained data in nine categories from their control group of high school athletes. Of these categories, three were significant to my action research: self-worth, social acceptance, and behavioral conduct. However, in conducting the survey, for reasons not presented in the article, only five categories were deemed “of interest” by the authors. Of these, only self-worth was pertinent to my work. Contrary to other studies done and cited in this article, this study found that female high school athletes have a higher sense of self-worth than male high school athletes, whereas previous studies from a “general student sample” indicate that “girls’ self esteem was significantly lower than that of boys” (2003, p. 662).

Weiss and Smith examined how “age and gender differences” affect self-esteem and the forming of friendships among younger children and adolescent athletes (2002, p.

420). Gender differences lead to greater variation in the self-esteem and conflict management skills than do age differences. It seems that greater intimacy among female athletes correlates with a more positive image of self than that of male participants. Adolescent male athletes consider conflict caused by “competition, [and] rivalries” to be the quality in sports that best helps forge friendships and a subsequent respect for others (Weiss & Smith, 2002, p. 433). These differences, how each gender views the making and maintaining of friendships, must be acknowledged in order to create a level of respect among members of a coeducational athletic team. Respect, for self and others, is a character trait. Few situations reveal an individual’s true character like their involvement in a conflict or competition. According to Weiss and Smith, “adolescents recognize that arguments, competitiveness, and aggression may be natural among friends, and that conflict management strategies and resolution skills are essential to preserving a friendship” (2002, p. 433). With that in mind, coeducational athletic endeavors, while none too common, place their participants in a much more realistic, true-to-life competitive situation because such endeavors involve members of both sexes.

“Humility, respect, [and] work ethic” are character traits listed as “general psychological qualities by elite athletes” (Holt, 2001, p. 462). Holt reveals that rewards extended to athletes for athletic performances and for exhibiting admirable character traits serve as incentives to demonstrate courteous behavior towards those involved in their sport.

Area of Focus Statement

The purpose of this study is to describe what effect participation in the high school, coeducational team sport of Ultimate Frisbee has on the self-esteem and self-

efficacy of the individual participants.

The Variables

1. Will a player's participation in team sports other than Ultimate Frisbee enhance, detract from, or have no significant effect on their level of self-esteem and self-efficacy?
2. Will there be a discernable difference in the effect of participating in Ultimate Frisbee between male and female players?

The Research Question

Will the concept of "spirit of the game," as it pertains to self-officiating and how one conducts himself or herself on the field, have an effect on the level of one's self-esteem and respect exhibited towards one's teammates and opponents?

Data Collection and Results

Steps to Action

Participants will be taught the rules of the game and the importance of adherence to said rules. Also, the necessity of working as a team will be stressed by requiring team members' participation in drills and practice activities.

Ultimate Frisbee is a fast-paced, fun, and exciting game. The emphasis here is on "fun." Once an individual learns to play the game, they want to play it at every opportunity they get. For this reason, as with almost any other sport, if a participant on the team exhibits poor sportsmanship or a lack of respect towards teammates or opponents, he or she will sit on the bench for the remainder of the half, if it takes place during a game, or will be required to run laps after practice. At a game or practice when such a lack of respect is exhibited, I, as coach, will again stress to the individual the

concept of “spirit of the game” and its importance. I will suggest an apology, but will, by no means, demand it. It is important for the participants to believe an apology is in order, not be forced into it.

Intervention or Innovation

Being the coach of a sport that appreciates respect of self and others during play, as much as the outcome of the game, I will reward those participants who exhibit exemplary “spirit” by allowing them more play time in games against other league schools. During our weekly practices, I will reward the exhibition of “spirit” with the privilege of choosing teams for scrimmage or deciding which “cool-down” game we play toward the end of practice. It has been my experience, after coaching for 3 seasons, that this provides a great incentive to achieve. Being awarded the team “Spirit of the Game” trophy at a league tournament should serve as incentive for the participants to perform with the highest level of respect and sportsmanship.

Time Line

1. Phase One: Identify area of focus, review related literature, determine variables, develop research questions, and perform reconnaissance.
2. Phase Two: Obtain approval from the IRB of UTC. Request permission from school administration. Gain informed consent of the student participants and their parents or legal guardians.
3. Phase Three: Collect initial data: finalize a team roster, and conduct initial interviews.
4. Phase Four: Begin practice for high school spring league and series. Series consist of a sectional, regional, and national tournament. Implement my reward strategy

for those participants who exemplify good “spirit.” Continue collecting data through meetings with assistants, parents, and faculty.

5. Phase Five: Continue collecting data. Develop presentation. Discuss action plan with assistants.

Data Collection

Using the Rosenberg Self-Esteem Scale (1965) and the Generalized Self-Efficacy Scale (Schwarzer & Jerusalem, cited in Weinman, Wright, & Johnston, 1995), I will document the level of self-esteem and self-efficacy of each participating student prior to the youth league season. At the completion of the season, I will once again administer an identical battery of tests to determine any changes among individual participants. A more qualitative approach for data collection will be necessary to document the level of respect exhibited by participants toward members of the opposite sex. Thus, I will rely on my observations as an active participant-observer in my role as head coach, and the aid of my assistants as privileged, active observers. To record accurate data, I will implement three techniques of observation, depending on the situation I am facing. The three techniques include “observe and record of everything,” “observe and look for nothing” in particular, and “look for paradoxes” in the behavior of the participants (Mills, 2003, p. 58). Through my various observation techniques, as well as the self-esteem and self-efficacy tests, I hope to determine whether or not those students are exhibiting higher levels of self-respect after having participated in a season of Ultimate Frisbee.

Statement of Resources

In addition to a playing field and some frisbees, I will need copies of the Rosenberg Self-Esteem Scale and the Generalized Self-Efficacy Scale. Qualitative data

collection techniques will be used as a secondary research method for this study. Using the aforementioned scales, coupled with observations, I intend to determine central themes concerning the effects of participation in Ultimate Frisbee by high school students.

Results

During this season, the high school's Ultimate Frisbee team consisted of 14 male participants and 7 female participants. For all but two of those participants, this was their first year to play in an organized and sanctioned Ultimate Frisbee league. Of the 21 students playing, 7 students submitted the appropriate paperwork (parental consent form and student assent form) required to take part in this study. Among the seven participating students, four were female and three were male. The scope of this study is limited to those players whose assent and consent forms were returned.

My observations indicate that small, but significant, improvements in self-esteem and self-efficacy took place among the participating students. The improvements in these two areas were confirmed by the pre-season/post-season administration of the Rosenberg Self-Esteem Scale and Generalized Self-Efficacy Scale. Similarly, small, but significant, improvements regarding the level of respect exhibited towards others were observed, but not formally evaluated using recognized instrumentation. The research participants whose levels of self-esteem and self-efficacy registered the greatest improvement were those students who were not currently involved in any other team sports. Of the seven research participants, four students, two male and two female, were in this category. The participants who were actively participating in other team sports recorded relatively high levels of self-esteem and self-efficacy on the pre-season scales. These high initial scores

left little room for improvement, but overall self-esteem and self-efficacy levels remained high within this group. All players were observed to demonstrate a higher degree of respect for others at the season's end. For example, as the season progressed, I witnessed fewer arguments about playing-time and strategies, and less finger-pointing. Additionally, the players became more enthusiastic and sincere in their end-of-the-game cheers of the opposing teams.

For the Rosenberg Self-Esteem Scale, the answers corresponding to the questions were assigned a numerical value. For questions 1, 3, 4, 7, and 10, the following values were assigned: Strongly Agree=3, Agree=2, Disagree=1, and Strongly Disagree=0. For questions 2, 5, 6, 8, and 9, the following values were assigned: Strongly Agree=0, Agree=1, Disagree=2, and Strongly Disagree=3. The scale ranges from 0-30, with 30 indicating the highest score possible.

The response format for the Generalized Self-Efficacy Scale includes the following:

1 = Not at all true, 2 = Hardly true, 3 = Moderately true, and 4 = Exactly true.

The scale ranges from 10-40, with 40 indicating the highest score possible.

Scales are presented below (see Figures 1 and 2). To ensure confidentiality, the participants are referred to by an assigned number (1-7) and descriptive abbreviations: gender (F = Female or M = Male), and participation in other team sports (O = Other team sports or N = No other team sports). Additionally, abbreviations indicate the scale in use (ROS = Rosenberg Self-Esteem, and GEN = Generalized Self-Efficacy) and the time each was administered (Pre = pre-season, and Post = post-season).

	Pre/ROS	Post/ROS	% Change	Pre/GEN	Post/GEN	% Change
1FO	24	26	6.67	28	33	16.67
2MN	13	23	33.33	23	29	20
3FN	13	21	26.67	20	28	26.67
4MO	23	23	0	32	35	10
5FO	24	27	10	31	30	-3.33
6MN	19	22	10	28	31	10
7FN	24	26	6.67	32	36	13.33

Figure 1. Pre- and post-season total scores and change as a percentage of the total possible scores for each individual

	Pre/ROS	Post/ROS	% Change	Pre/GEN	Post/GEN	% Change
Average Participant in Other sports	23.67	25.33	5.56	30.33	32.67	7.8
Average Participant in No Other sports	17.25	23.00	19.17	25.75	31.00	17.5
Average Female	21.25	25.00	12.50	27.75	31.75	13.33
Average Male	18.33	22.67	14.44	27.67	31.67	13.33

Figure 2. Pre- and post-season average scores comparing students who do and do not play other sports and comparing female to male participants.

Conclusions and Recommendations

While the amount of data collected is insufficient to establish a generalized conclusion concerning the effects of participation in Ultimate Frisbee on high school students, the data do support the recognized theory that playing team sports improves the levels of self-esteem and self-efficacy among high school students. As reported by Marsh and Kleitman (2003), taking part in team sports has been shown to improve self-concept. Additionally, the work of Todd and Kent (2003), reveals that athletes maintain a higher opinion of self than non-athletes. The data presented above suggest that student athletes do register measurably higher self-esteem and self-efficacy than non-athletes. Generally, students who were not previously involved with organized team sports showed the greatest improvement, while the students who had previously been involved in team sports registered consistently higher levels. Data also indicate that gender differences have little bearing on pre-season/post-season improvements in either self-esteem or self-efficacy. While the data collected show the single greatest improvement in levels of self-esteem were demonstrated by a female participant, her improvement was followed closely by that of a male participant. Furthermore, the average change in self-efficacy was identical between males and females; the two groups also had similar average improvement on the Rosenberg Scale. Further studies involving more participants would be useful in substantiating or disputing the findings of this study, but this research does support the assertion that participation in Ultimate Frisbee can produce identifiable improvements in self-concept, regardless of gender or prior athletic experience. In the future, a practical and implementable action plan will be developed to introduce the sport of Ultimate Frisbee to the faculty of Notre Dame High School, as well as to the

administrators and faculty of other schools and academic institutions as a means of teaching the value of self-respect and respect of others to a student body and society as a whole.

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An Evaluation of Learning in a Eurasian Geography Unit
Through a Pre-test/Post-test

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Education 590, Spring 2007

The University of Tennessee at Chattanooga

*The Institutional Review Board of The University of Tennessee at Chattanooga
(FWA00004149) has approved this research project 07-037.*

Introduction to the Problem

This research was to evaluate the effectiveness of instruction for a 3-week block of instruction on Eurasia, including Belarus, Russia, The Ukraine, Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan. A pre-test was used to measure the student's prior knowledge of the area and the same test was given as a post-test to measure student learning of the subject.

The high school where the unit was taught contains about 1,000 students, approximately 60 percent white, 37 percent black and 3 percent Asian or Hispanic. On the Socioeconomic continuum, the student body was in the lower middle class, with few students from affluent families or from extreme poverty. About 38 percent of the student body was considered to be "economically disadvantaged."

The unit was taught to approximately 110, ninth-grade students, of whom 71 completed both the pre-test and post-test. The students were taught in six, 80-minute blocks that met four times each week. Under school district guidelines, students have already had a geography course and an early world history course in middle school.

The objective of the unit was that most of the students would learn sufficient geography about Eurasia to successfully pass the post-test and the unit. The teacher anticipated student involvement, active questioning, and seeking after knowledge about Eurasia.

Review of Literature

Assessment of learning is an important part of teaching learning. Students, on their part, must be able to demonstrate adequate achievement. Likewise, through assessment, the teacher gauges the effectiveness of his or her instruction (Ediger, 2001).

The National Assessment of Educational Progress (NAEP, National Center of Education Statistics, 1994) uses three geographic content areas as the basis for its periodic assessment of geography learning: (a) space and place, (b) environment and society, and (c) spatial dynamics and connections (Stoltman, 1997). The NAEP made assessments of geography learning in 1994 and 2001. (The next assessment is scheduled for 2010.) The assessments found a small improvement in mean scores for the fourth- and eighth-graders between 1994 and 2001. Scores for 12th- graders remained the same. It was also found that the scores for male and female students improved at the same rate in the fourth and eighth grades. But at the 12th-grade level, female student scores improved slightly while male student scores dropped slightly. In all grades, the mean score for males was slightly higher than that for females. The 2001 assessment also showed significant improvement for black, fourth-grade students. These score were almost equal to scores by the next highest disadvantaged group, Hispanics. Native American students in the fourth-grade also showed improvement. Other racial groups had small improvements in score, except for Asian and Pacific Islander students, where there was a slight drop, but this group still maintained second place by a comfortable margin. Eighth-grade students showed some increase in scores between 1994 and 2001, especially by Native Americans. Twelfth-grade scores between 1994 and 2001 were essentially identical. Overall, the percentage of students considered to have basic geography skills increased between 1994 and 2001, while the percentage attaining the proficient level remained the same. Regional average scale scores are shown below in Figure 1.

Grade 4	Northeast	Southeast	Central	Western
1994	203	200	215	205
2001	214	207	219	200
Grade 8				
1994	266	252	268	255
2001	266	260	270	255
Grade 12				
1994	284	278	289	286
2001	286	281	287	283

Figure 1. Regional Average NAEP Scores. Source: NAEP Geography Report Card, Table B.10

The Central Region had the highest average scores in both 1994 and 2001.

However, the Southeast Region closed some of the gap. Fourth- and eighth-grade scores in the Southeast Region were higher in 2001 than those for the Western Region. Twelfth graders in the Southeast Region did move up and were very close to the mean score for 12th graders in the Western Region, where the average score actually dropped.

Research has found geography to be one of the more difficult subjects for students due to (a) expository text, (b) unfamiliar concepts, and (c) new vocabulary. (Gregg, 2006a, 2006b) The teaching of the concepts is important to student learning of geography.

There are various ways to approach the teaching of geography. Active learning strategies are considered by some authorities to be the most effective in teaching the principles of geography. Group learning can be one element of active learning, but there are others that lead to increased student involvement and learning (Klein, 2003).

“[A]ction research [is] practical inquiry that is, research to develop practical knowledge and to improve classroom practice in a given context” (Bednarz, 2002, p. 103-104). There is a need for research about educating students in geography. Action research helps to support such research, while, at the same time, providing answers, or, at least,

helpful hints, to geography teachers in the task of everyday teaching. Such research includes, but would not be limited to, student perceptions, tests, and, interestingly, student study habits. Methodologies may include questionnaires, surveys, individual student interviews, and assessments (Bednarz, 2002). Students are the objects of instruction, but they can also provide valuable input to the teacher about their learning through action research:

Action research changes this [teacher's] practice of reflection about content and teaching strategies into an organized and structured process with actual data that can be analyzed and used to improve instruction. Also, students are forced to think about the way they learn which is not necessarily a naturally occurring process for them, creating more active learners. (Bednarz, 2002, p. 109)

Data Collection and Results

Data Collection

Subjects

There were approximately 110 students in the six blocks of geography taught, with classes ranging in size from 14 to 23 students. Due to absence, suspension, transfers in and out, and other circumstances, 71 students completed both the pre-test and post-test. The pre-test was administered at the beginning of the unit. The post-test was administered at the conclusion of the unit. A study guide was given to the students before the weekend prior to the post-test, as homework. The study guide was reviewed in class prior to the test.

Methodology

The 71 sets of tests were analyzed for differences in pre-test and post-test scores. Then, 70 sets of tests (one post-test was lost between the scoring of tests and detailed analysis) were analyzed by block, by race, by gender, and, finally, by selected questions most frequently correct and most frequently missed. The test was composed of 15 multiple choice questions, 15 matching questions, and 4 short answer questions. Multiple choice and matching questions counted two points each, while the short answer questions counted 10 points each. The pre-test/post-test is contained in Appendix A.

Instruction plan

Instruction was by using various strategies. There was some direct instruction; seatwork, including the use of almanacs and map references in the text; class reading of the text; and a few handouts such as one on why the population of Russia is decreasing. Also used were excerpts of videos on Russian history, culture, and travelogues. The length of the videos varied, but were edited not to exceed about 20 minutes. Worksheets were used only with the more lengthy videos. Group work was done sparingly and varied by block. The only assigned homework was the study guide.

Results

Pre-test results showed the students had a rudimentary knowledge of Russia and Eurasia. The average (mean) score on the pre-test was 20.8. One student (whose father was Russian) scored a 41. Ten students had scores of 30 to 39. Five students had scores of 10 or less. The remaining 55 students had scores in the teens or twenties (11-29). The range of scores was 6 to 41. Post-test results showed an average (mean) score of 59.1, an increase of 38.3 points (see Figure 2). However, by school district standards, only 36 percent (26 students) passed the test. There were 3 A's, 7 B's, 5 C's, and 11 D's (65 to

74). One student scored less on the post-test than on the pre-test and another student scored the same on both tests. The range of scores on the post-test was 13 to 95.

Student	Pre-test	Post Test	Difference	Student	Pre-test	Post-test	Difference
1	24	59	35	46	21	46	25
2	18	35	17	47	32	40	8
3	17	34	17	48	28	48	20
4	22	44	22	49	12	45	33
5	22	53	31	50	15	45	33
6	24	57	33	51	15	58	43
7	32	78	46	52	26	83	57
8	20	29	9	53	14	67	53
9	15	41	26	54	6	66	60
10	24	73	49	55	10	36	26
11	38	67	29	56	22	93	71
12	15	73	58	57	27	83	56
13	19	66	47	58	15	87	72
14	37	48	11	58	15	87	72
15	17	52	35	59	19	62	43
16	37	64	27	60	11	78	67
17	11	64	53	61	27	79	52
18	15	40	25	62	13	13	0
19	23	64	41	63	9	40	31
20	6	75	69	64	23	64	41
21	15	77	62	65	33	81	48
22	19	40	21	66	19	57	38
23	16	47	31	67	15	54	39
24	32	95	63	68	27	67	50
25	20	47	27	69	16	40	24
26	41	95	54	70	18	56	38
27	22	59	37	71	20	61	41
28	28	94	66				
29	12	51	39	Mean	20.8	59.1	38.3
30	24	68	44				
31	27	54	27				
32	29	26	-3				
33	18	42	24				
34	18	42	24				
35	18	58	40				
36	11	34	23				
37	32	53	21				
38	10	72	62				
39	22	62	40				
40	31	87	56				
41	23	73	50				
42	9	54	45				
43	30	55	25				
44	17	41	24				

45 25 83 58
Figure 2. Pre-test and post-test scores.

Analysis

In an absolute sense, the unit did not achieve its objective. Just over one-third of the students achieved a passing score. Improvement was shown with a difference in mean scores between the pre-test and post-test of 38.3 points, almost double the pre-test mean score. With the grades from classwork, most students would have passed the unit.

Figure 3 shows the mean pre-test and post –test scores by block (class). Also see Figure 1.

Block	Pre-test	Post-test	Difference
1A	23.8	54.6	30.8
2A	20.9	68.2	47.3
5A	20.8	49.9	29.1
1B	22.7	58.4	35.7
2B	16.3	65.1	48.8
5B	21.1	59.4	38.3
For All Blocks	20.8	59.1	38.3

Figure 3. Average scores for each block.

Blocks 2A and 2B did very well, with increases of 47.3 and 48.8 points. Block 5B had an increase that was the average for all blocks. Block 1B had a respectable increase of 35.7 points. Blocks 1A and 5A had the smallest increases, with 30.8 and 29.1 point increases.

The mean scores were analyzed on the basis of race. The results are shown in Figure 4. There were two Hispanic females in the sample; their scores are included with the White students.

	<i>n</i>	Pre-test	Post-test	Difference
Black	35	19.4	57.2	37.8
White	36	22.2	60.5	38.3

Difference		2.8	3.3	.5
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Figure 4. Mean scores by race.

White students scored better on the pre-test than did black students, but the difference was only 2.8 points, or about 12 percent of the White mean. Both groups displayed only a rudimentary knowledge of the geographic area covered in the unit. On the post-test, both groups improved by well over 30 points, and the difference in scores was only 0.5.

Statistically, the improvement for both groups was the same.

Data analysis by gender is shown in Figure 5. Females scored slightly less well than males on the pre-test and scored almost the same on the post-test. Females showed a slightly better improvement than did the males. There is no significant difference in mean scores between males and females.

	<i>n</i>	Pre-test	Post-test	Difference
Male	39	21.4	59.0	37.6
Female	32	20.4	58.8	38.4
Difference		1.0	0.2	0.8

Figure 5. Mean scores by gender.

However, an analysis of mean scores on the basis of race and gender shows some interesting results (see Figure 6). The difference between the mean scores for Black males and White males more than doubled between the pre-test and post test. The difference between Black females and White females on the pre-test and post-test was reduced by half. Black males did better on the pre-test than did Black females, while, on the post-test, Black females did notably better, 3.3 points than Black males.

		Males			Females	
	Black	White	Difference	Black	White	Difference
Pre-test	19.9	22.7	2.8	18.8	22.8	4.0
Post-test	55.6	61.9	6.3	58.9	60.9	2.0
Difference	35.7	39.2	3.5	40.1	38.1	2.0

Figure 6. Mean scores by race and gender.

An analysis of the questions most frequently correct and incorrect was performed. On the pre-test, questions that were answered correctly by 45 percent or more of the students were multiple choice numbers 1, 5, 8, 9, and 10; and matching questions 5, 13, and 15 (See Appendix A). Almost half the students knew Russia was the world's largest country, the definition of infrastructure, the capitol of Russia, the location of Vladivostok, that oil and natural gas were Russia's major exports, the definition of nomads, what caviar was, and the definition of permafrost. The questions that less than 20 percent of the students answered correctly were multiple choice numbers 4, 6, and 14; and matching questions 3 and 11. These were more technical questions about the Soviet Union's and Russia's history and geography.

On the post-test, questions answered correctly by 80 percent or more of the students included multiple choice numbers 1, 2, 3, 4, 7, 10, and 15; and matching questions 5 and 15. The same questions that were most frequently answered correctly included multiple choice question numbers 1, 5, 10; and matching questions 5 and 15. The students also learned about the Silk Road, the definition of autarky, the Cyrillic Alphabet, and the definition of “—stan.” The questions that 60 percent or less of the students answered correctly included multiple choice numbers 6, 8, 11, 13, 14; and matching questions 6, 8, and 10. It should be noted that, on the pre-test, more the 45 percent identified Vladivostok as Russia's Pacific Ocean port, but less than 60 percent did so on the post-test. Also, fewer than 60 percent learned that St. Petersburg is on the Baltic Sea. They knew what the Silk Road was, but not that Samarqand was a city on the Silk Road, and did not grasp the concept and consequences of collectivization. Definitions of “dacha” and “Eurasia” also were frequently missed.

The short answer questions were a particular disappointment. On the pre-test, only about 25 percent of the students attempted to answer one or more of the short answer questions. This is, perhaps, understandable on the pre-test, since a short answer question might require a level of factual knowledge and synthesis the students did not have. Still, on the post-test, fewer than two-thirds of the students attempted one or more of the short answer questions. There was a marked difference by race, in responses to the short answer questions. On the post-test, more than 85 percent of the White students attempted to answer one or more of the short answer questions. One or more of the short answer questions were attempted by Black females, but only 66.7 percent of the Black males attempted to answer one or more of the short answer questions. This was the primary reason for the lower average score for Black males.

The instructional strategies were varied somewhat. Direct instruction was usually limited to about 20 minutes at a time. Seatwork, a few handouts, and videos were used. Videos were limited in duration to between 10 and 20 minutes. Worksheets were used only with the longer videos. One block was shown few videos due to classroom management difficulties.

Conclusions and Recommendations

Conclusions

The unit as taught was moderately effective, but could have been made more effective.

The testing results revealed some agreement and contrasts with the literature. As with the NAEP, males usually outscored females by a small margin. However, in this case black females outscored black males on the post-test. On the NAEP blacks scored

significantly lower than whites. In this sample the blacks also scored lower than whites, but the difference in post-test means scores was just over 3 percent between black females and white females. The difference between black males and white males was slightly less than 12 percent. The three 'A's' earned on the post-test were two white males and a black female. Learning in mixed race classes may be of benefit.

Analysis of the most frequently correct and most missed question shows the most frequently correct questions on the pre-test were not usually the most correct on the post-test. Similarly, the questions most missed on the pre-test were not usually the most missed on the post test. Only two of the most missed questions on the pre-test were missed by 40 percent or more of the students on the post-test.

Recommendations

The unit, as taught, was moderately effective, but could have been made more effective. The students were not as involved in active learning as was desired, especially noted in the lack of questions from the students. Some changes to instructional strategies might have included the following:

1. More structured group work, especially on the almanac worksheet. This might have speeded completion of the worksheet and allowed more time for analysis of the data by the students.
2. More structured use of the videos, e.g., more worksheets, an introduction with objectives to watch for in the video, and discussion following the video.

A concern is the differences between White and Black students in attempting the short answer questions. The writer cannot say whether the students were actually

stumped by the questions, were too timid to attempt an answer, or were, simply, too lazy.

This aspect of the action research is one that merits further investigation.

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Appendix A

RUSSIA & CENTRAL ASIA

Pre-test/Post-test

Multiple Choice

1. The world's largest country in land area is:
 - a. China
 - b. Russia
 - c. Canada
 - d. America

2. The mountains that divide Russia between East and West, and between Europe and Asia are:
 - a. The Alps
 - b. Pamirs
 - c. Pyrenees
 - d. The Urals

3. The historic trade route from China through central Asia to Europe is called:
 - a. The Silk Road
 - b. The Trail of Tears
 - c. The Trans-Siberian
 - d. The Copper Trail

4. What does CCCP stand for
 - a. Union of Socialist States
 - b. Canton Chinese Communist Party
 - c. Union of Soviet Socialist Republics
 - d. Certified Correct Communist party

5. Road, bridges, phone lines, etc. are known as:
 - a. utilities
 - b. infrastructure
 - c. communications
 - d. capital investments

Matching (choose the letter of the correct response.)

- | | |
|----------------------|---|
| 1. Volga <u>d</u> | a. The world's largest freshwater lake |
| 2. Baikal <u>a</u> | b. A place of land |
| 3. Gulag <u>e</u> | c. Herders who move from place to place |
| 4. '--stan' <u>b</u> | d. A River in Russia |
| 5. Nomads <u>c</u> | e. Force and slave labor camps |

Appendix A

p. 2

Multiple Choice:

6. Cultivation of a single crop as the main product is known as:
 - a. Monoculture
 - b. Cash crop
 - c. Corn
 - d. Crop rotation.
7. The economic system where a country tries to produce all the good it needs is called:
 - a. mercantilism
 - b. autarky
 - c. NAFTA
 - d. Protectionism
8. Russia's main seaport on the Pacific Ocean is:
 - a. Odessa
 - b. St. Petersburg
 - c. Vladivostok
 - d. Sevastopol
9. The capitol of Russia is:
 - a. St. Petersburg
 - b. Minsk
 - c. Kiev
 - d. Moscow
10. Russia's major export(s) is
 - a. Oil & natural gas
 - b. Cotton
 - c. What
 - d. Machinery

Matching (Choose the letter of the correct response)

- | | | | |
|---------|-------------|----------|------------------------------------|
| 6. | Dacha | <u>h</u> | f. The area from the Baltic to the |
| Pacific | | | |
| 7. | Czar | <u>I</u> | g. Capitol of Azerbaijan |
| 8. | Eurasia | <u>f</u> | h. Country cottage in Russia |
| 9. | Novosibirsk | <u>j</u> | i. Emperor |
| 10. | Baku | <u>g</u> | j. A city in Siberia |

Appendix A

p. 3

Multiple Choice

11. The most important Russian City on the Baltic Sea is:
 - a. Odessa
 - b. St. Petersburg
 - c. Riga
 - d. Helsinki

12. Three inland lakes and seas in central Asia include:
 - a. Astral Sea, Caspian Sea, Lake Balkhash
 - b. Caspian Sea, Black Sea, Baltic Sea
 - c. Sea of Japan, lake Baikal, Barents Sea
 - d. White Sea, Caspian Sea, Black Sea

13. What city was on the Silk Road and Capitol of Tamerlane's Empire:
 - a. Tbilisi
 - b. Samarqand
 - c. Xian
 - d. Bagdad

14. Food production in the former Soviet Union was a problem primarily due to
 - a. poor soils
 - b. wars
 - c. collectivization
 - d. weather

15. Most of Europe uses the Latin alphabet. Russia and some other Slavic languages use an alphabet called:
 - a. Universal
 - b. Calligraphy
 - c. Cyrillic
 - d. Greek

Matching. (Choose the letter of the correct response)

11. Steppes ____n____ k. Fish eggs
- l. A mountainous area between the Black and Caspian Seas
- m. Ground that never thaws
- n Flat grasslands
- o. A steppes people sometimes used as police

Short Answer Questions

1. Central Asia Face some Severe Economic and Environmental problems. Name 3 major problems discussed in the textbook.

Answer might include: Shortage and misuse of water resources, monoculture, overuse of fertilizers ruined the soil, environmental problems resulting from nuclear and bacteriological weapons testing, lack of human and financial capital.

2. Russia, Belarus and the Ukraine have lost population over the past twenty years. Give two reasons why?

Answer may include any of the following: Drug and especially alcohol abuse, collapse of the health services, poor standard of living, high abortion rate.

3. Siberia has plentiful natural resources. What are two reasons that make it difficult to develop these resources?

Environment and location. Half credit for severe cold or permafrost, and transportation, lack of capital, government policies.

4. What was the overland trade route between China and Europe called? What are some modern day countries the trade route passed through? And why did this trade route lose its significance?

The Silk Road

Accept China, Afghanistan, Tajikistan, Turkmenistan, Iran, Iraq

The Europeans developed ships that could sail around Cape Horn (Africa) and on to China and back.

Improving Middle School Students' Problem Solving Skills

by Increasing the Use of Word Problems

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Education 590, Spring 2007

The University of Tennessee at Chattanooga

The Institutional Review Board of The University of Tennessee at Chattanooga (FWA00004149) has approved this research project 07-023.

Introduction to the Problem

The National Council of Teachers of Mathematics (NCTM) recognizes that there are many students that are not learning the mathematics concepts they need and are expected to learn. In 1989, the NCTM introduced the *Curriculum and Evaluation Standards for School Mathematics (Standards)* “as a guide for focused, sustained efforts to improve students’ school mathematics education” (National Council of Teachers of Mathematics [NCTM], 2000, p. 6). The NCTM has identified problem solving as an important area of study. Mathematical problem solving allows students to acquire new ways of thinking and encourages confidence in unfamiliar situations that will carry over from their math class and into real-world situations (NCTM, 2000). The problem solving standard focuses on enabling all students to, “build new mathematical knowledge through problem solving; solve problems that arise in mathematics and in other contexts; apply and adapt a variety of appropriate strategies to solve problems; monitor and reflect on the process of mathematical problem solving” (NCTM, 2000, p. 52).

Problem solving should be a critical component of a math curriculum, given its role in obtaining a majority of jobs in today’s technology-driven society (Jitendra, Hoff, & Beck, 1999). Society and the job market seek people who, not only have knowledge, but, also, can apply the knowledge to varying situations (Weidermann, 1995). Teachers’ efforts to improve problem-solving skills will benefit their students, not only in math class, but, also, for the rest of their lives. Teachers recognize the importance of improving problem-solving skills, however, many teachers do not spend adequate time going over these skills in the classroom (Weidermann, 1995). Many students welcome the inadequate attention to problem solving, as they encounter frustration and failure when

trying to solve routine word problems (Zambo, 1996). Many times, children working on word problems experience difficulty in identifying the correct operation to use and how to write an arithmetic sentence to solve the problem (Sellke, Behr, & Voelker, 1991).

To counteract the negative attitude towards word problems, teachers need to create “an environment in which students feel safe trying to solve problems in their own ways. This approach will build confidence and help students develop greater skill in problem solving” (Weidemann, 1995, p. 12). Weidemann suggests, “the middle grades provide an optimal time to teach problem solving” (Weidemann, 1995, p. 13). By the time students are in middle school, they have learned many of the basic mathematical concepts and are ready to apply those concepts in more abstract ways. The use of interesting and challenging word problems will, hopefully, provide a means for the students to remain interested in math (Weidemann, 1995). While middle school may be the ideal time to utilize word problems, assessments conducted by the National Assessment of Educational Progress indicate that many middle school students perform poorly on word problems (Muth, 1992).

Review of Literature

Teaching Strategies

Numerous teaching strategies, committed to increasing students’ problem-solving skills with word problems, have been developed and put into practice. There have been numerous studies that focus on activating students’ cognitive and metacognitive awareness when solving word problems. To improve students’ success, teachers can implement a cognitive strategy for instruction that would include paraphrasing, visualizing, and estimating the answer, or a metacognitive approach that would foster

self-questioning, self-instruction, and self-regulation (Jitendra et al., 1999). Focusing on the cognitive activities needed to solve the problem takes away the pressure of trying to find the solution (Fortunato, Hecht, Tittle, & Alvarez, 1991). Effective and efficient problem solving depend, not only on the students' ability to choose an appropriate cognitive approach, but, also, on their ability to self-assess their performance (Montague & Applegate, 1993). The results of a study done by Montague suggest "that cognitive and metacognitive strategies for mathematical problem solving may be more effective as an instructional package for middle school students than either cognitive or metacognitive strategy instruction alone" (Montague, 1992, p. 241).

Fortunato et al. (1991, p. 38) stress the importance of reading word problems to "determine the main ideas, collect data from the problem, and then determine a method of solution." Weidemann (1995) expands these steps by placing more focus on understanding the problem. To fully understand the problem, the student should put the problem into their own words or draw a diagram. In doing so, the student needs to identify any specific details or limitations presented in the problem. Zambo (1996) adds a final step to the process by discussing the importance of verifying the solution once it has been determined.

The steps already identified are used in many classrooms, yet word problems still cause confusion in the minds of math students. A suggestion to help clarify the problem solving process is to have students write their own word problems, which will provide "insight on the relationship between verbal expressions and equations" and will allow students to communicate in mathematical terms (Wilde, 1991, p. 40). Requiring students to write their own word problems will help them learn how to read the problems

presented in class (Fairbairn, 1993). Teachers may find that their students dislike this assignment, however, teachers can make the assignment more interesting by asking the students to write word problems based on advertisements or television commercials (Wolf, 1991). The practice of writing their own math problems will, not only help the students, but, also, help the teachers. Teachers can use the writing to assess the students' understanding of a topic to determine if more instruction needs to occur on the topic (Wilde, 1991). If writing the problems does not appeal to students, then teachers can ask the students to verbally communicate the mathematical concept. "Activities that require communication will help students to clarify, refine, and organize their thoughts and to consider alternative approaches and solutions to mathematics problems" (Greenes, Schulman, & Spungin, 1992, p. 78). A study conducted by Muth (1992) recommends the use of thinking-out-loud in the classroom, which will allow the students to express their ideas, while providing the teacher with valuable information regarding the student problem-solving procedure.

Word Problem Selection

Choosing the correct word problems can be stressful for teachers, however, there are numerous resources available to assist with this task. Problems do not have to be made up from scratch; teachers can modify old problems into a problem more appropriate for their classroom (Fairbairn, 1993). The problems do, however, need to be nonroutine, so that students will have to think in order to solve the problem (Fortunato et al., 1991). Teachers should choose problems that are best suited for their students. "A good problem will demonstrate to students the necessity of understanding a specific concept, will involve a technique that can be applied to other situations, and will offer the student the

freedom to use several different approaches to obtain the answer” (Weidemann, 1995, p. 16). Fairbairn (1993) suggests making the problems more appealing to students by using situations to which they can relate and are interested in solving.

Through research it is evident that improving problem solving skills is an important part of a math curriculum and that there are numerous philosophies surrounding the most effective way to improve these skills. By conducting research on the use of word problems with middle school students, I hope to answer the following question. Does daily exposure to word problems improve the student’s problem solving skills, as measured by an increase in the number of correct answers on word problems assigned on homework and tests? Through answering this question I anticipate the research will provide insight on the best practices for presenting word problems to middle grades students and identify the strategies the students use to solve the problems.

Data Collection and Results

Data Collection

Population

The sample of students in this study came from a suburban elementary school in Signal Mountain, Tennessee. The population consisted of 18 fifth-grade students, 8 of which were female students and 10 were male students. The sample population was 100% Caucasian, which is aligned with the population of the school. The students came from upper-middle-class and middle-class families, and parental involvement was very apparent. The students were high-performing in their academic studies, with combined

grade point averages greater than 85%. The study was conducted in a self-contained classroom during the time allotted for mathematics instruction.

Materials

Materials used in the study included various word problems obtained from current literature and textbooks related to the area of study (see Appendix A). The students also completed a solving word problem strategy survey and a journal assignment, which were used to assess the strategies used to solve word problems throughout the study (see Appendices B and C).

Procedures

The study was conducted over 4 weeks, broken into two sessions. The first 2 weeks (session 1) consisted of the students receiving various word problems in their homework assignments and on a unit test. In total, the students received 30 word problems during session 1. The students worked on the problems independently to gauge their problem-solving abilities. At the end of session 1, the students completed a more complex problem from the Everyday Mathematics text. Upon completion of the problem, the students completed a 21-question survey on the steps they used to solve the problem. An example of the survey can be found in Appendix B.

During the next 2 weeks (session 2), the students were presented a word problem prior to the start of each mathematics class as a warm-up exercise. Various word problems were chosen, based on the topic being studied in class. Samples of the word problems can be seen in Appendix A. The students would solve the word problem independently and then would engage in a whole class discussion on the strategy used to solve the problem. During the whole class discussion, strategies and methods were

presented to assist the students in future problem-solving activities. During session 2, the students continued to receive word problems in their homework assignments and on a unit test. The students received the same number of word problems in homework assignments and on the test as they did in session 1 (30 word problems). See Figure 1. Session 2 also concluded with a complex word problem from the Everyday Mathematics text, similar to the problem presented in session 1. The students then completed the same 21-question survey they took during session 1. At the end of session 2, the students were asked to reflect on their problem solving skills through a journaling assignment (see Appendix C). Direct observation, the survey results, and the journal assignment were used to draw conclusions and make recommendations for the project.

Results

Homework and Test

During both sessions, the students were assigned 30 word problems in daily homework assignments and unit tests. The students answered 420 questions correctly out of 540, or 78%, during session 1, and 460 correct out of 540, or 85%, during session 2. The mean scores for sessions 1 and 2 for the class were 23.33 and 25.56, respectively (see Figures 1 and 2). There was a 7.41% increase in the number of correct answers on word problems presented on homework and tests. Overall, 12 students increased their scores, 1 student score remained constant, and 5 students' scores decreased.

Student	Session 1	Session 2	% Change
1	23	25	6.67%
2	18	23	16.67%
3	17	21	13.33%
4	28	28	0.00%
5	25	24	-3.33%
6	29	27	-6.67%

7	27	24	-10.00%
8	20	23	10.00%
9	19	25	20.00%
10	16	22	20.00%
11	30	28	-6.67%
12	25	27	6.67%
13	23	27	13.33%
14	27	26	-3.33%
15	24	29	16.67%
16	26	30	13.33%
17	21	24	10.00%
18	22	27	16.67%
Total	420	460	7.41%
Mean	23.33	25.56	

Figure 1. Summary of word problems answered correctly out of a possible 30 questions.

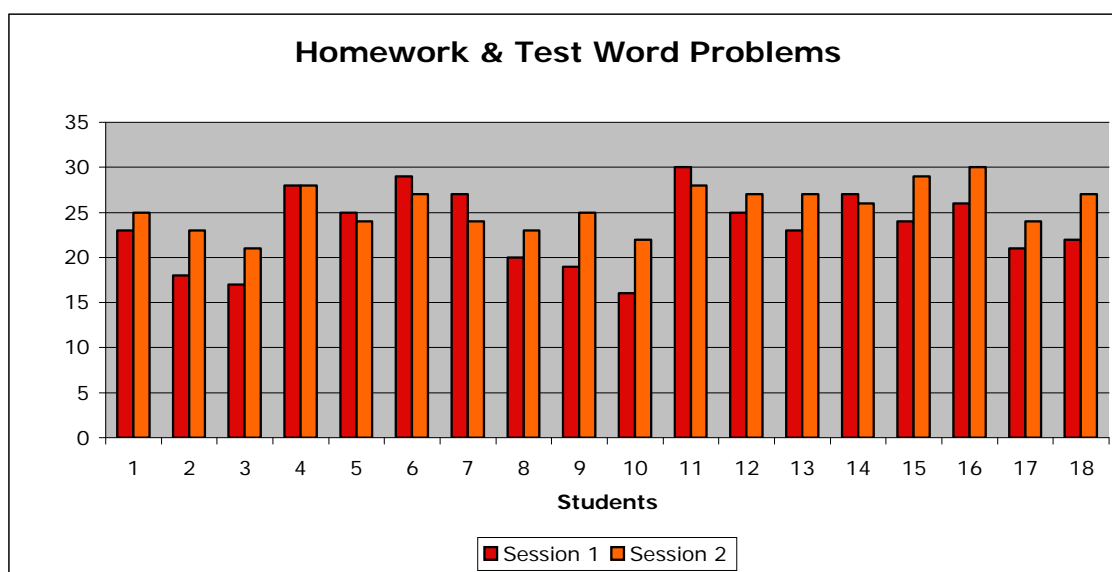


Figure 2. Summary of word problems answered correctly out of a possible 30 questions.

Survey

At the end of each session, the students were presented with a multistep word problem from their Everyday Mathematics text. The students worked on the problem independently and completed a 21-question survey. The purpose of the survey was to determine the strategies used by the students to answer the end-of-session word problem. The first six questions of the survey asked the students to reflect on the metacognitive

process used before they began to solve the problem. The metacognitive strategies were taught during session 2, therefore an increase in usage of these strategies occurred, as was expected, in the results between session 1 and session 2 (see Figure 3).

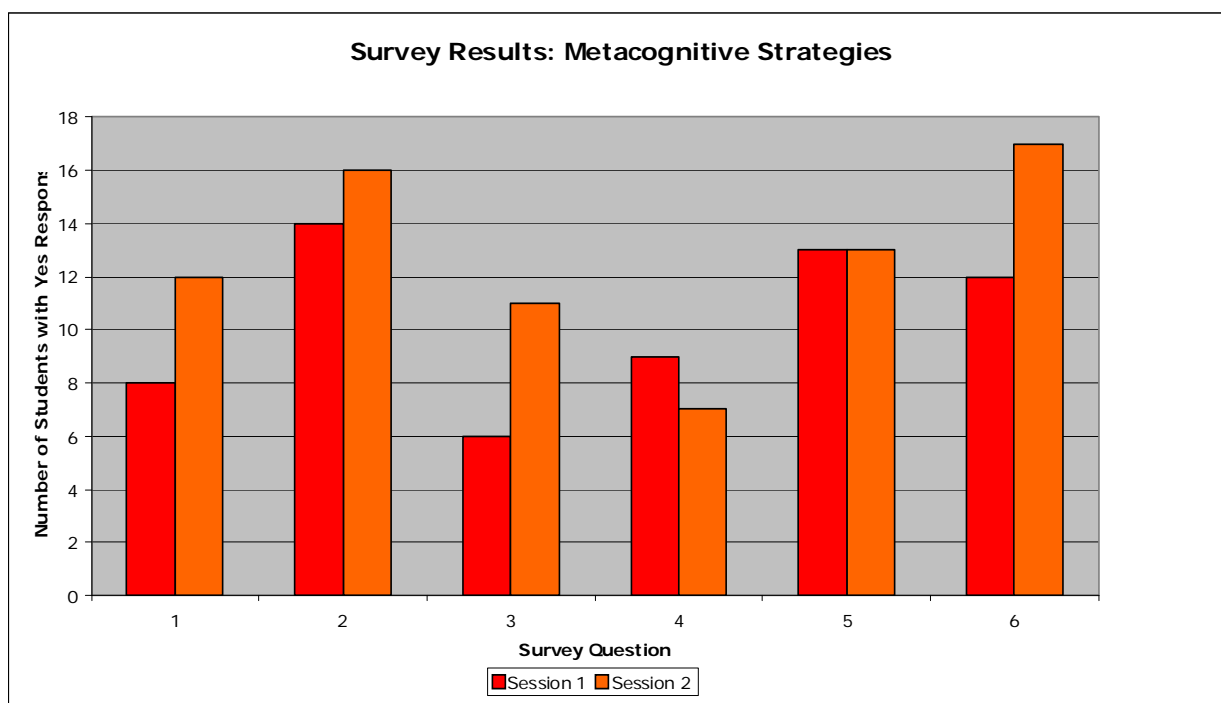


Figure 3. Summary of yes responses for questions 1 through 6 of the survey.

The next five questions of the survey asked the students to reflect on the strategies they used while working the end-of-session word problems. Questions 7, 8, and 10 asked students to break the word problem into steps and concentrate on each step, separately, to answer the problem correctly. During session 2, this strategy proved beneficial for the students and an increased use of this strategy was apparent in the number of students who used it to complete the problem at the end of session 2. Questions 9 and 11 asked the students to determine if, while solving the problem, they had to rethink or redo any of the steps. The responses to these two questions were mixed, as some students did not have to redo any steps of the problem (see Figure 4).

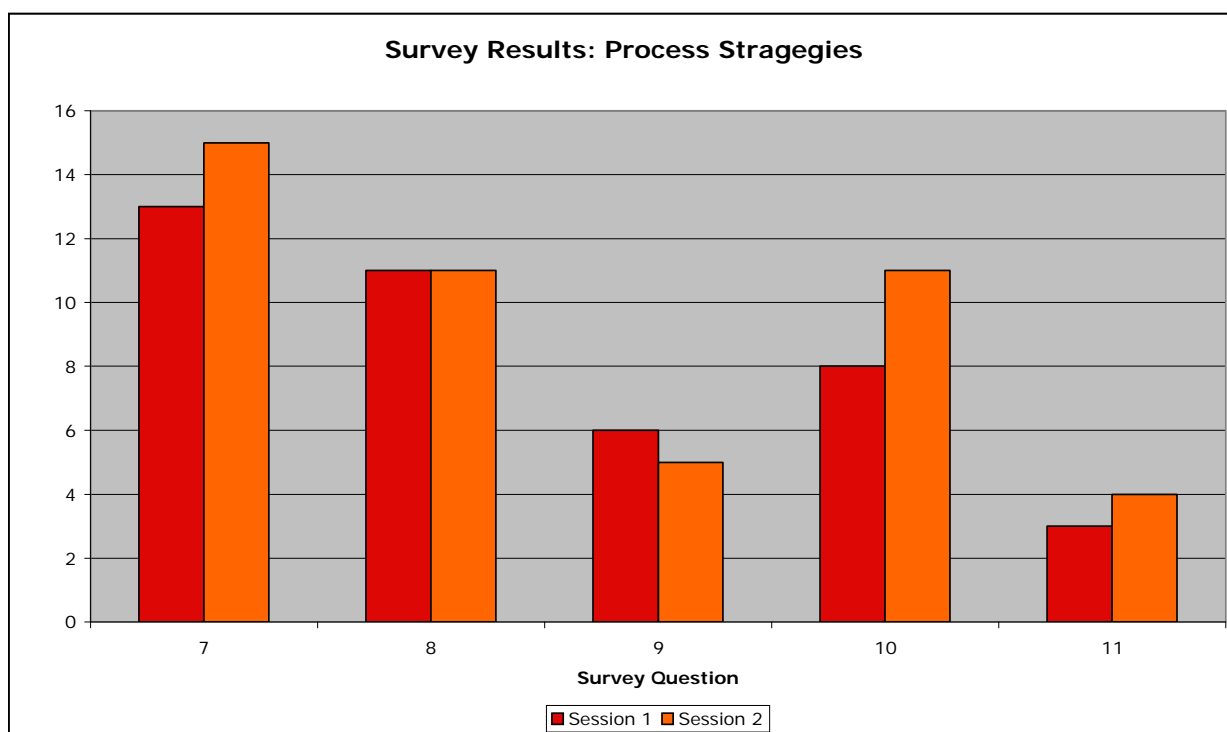


Figure 4. Summary of yes responses for questions 7 through 11 of the survey.

The next set of questions, 12 through 16, asked students to determine the strategies used, once they had finished the problem. Once again, the strategies recommended by the survey were introduced during session 2 whole class discussions. An increase in use of these strategies would be a positive result on the students' problem-solving skills. As expected, session 2 survey results indicated an increase in strategies used after a problem has been solved (see Figure 5).

The final section of the survey, questions 17 through 21, asked the students to identify if they used a particular strategy to solve the word problems. The strategies included drawing a picture, a guess and check method, selecting the specific operation needed to solve, pulling out important information, or not defining a strategy. The different types of strategies were talked about during whole class discussions during

session 2. The results indicate that, at the end of session 2, more students had selected a strategy to use, versus feeling confused and not being able to decide what to do (see Figure 6).

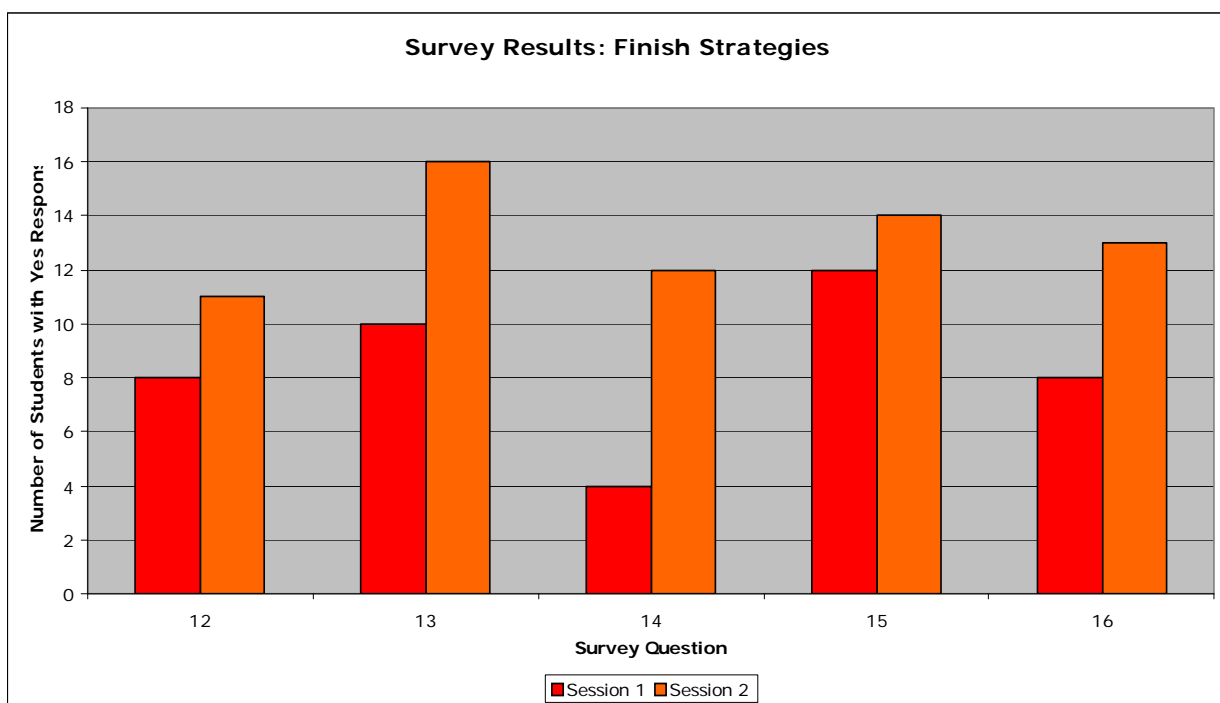


Figure 5. Summary of yes responses for questions 12 through 16 of the survey.

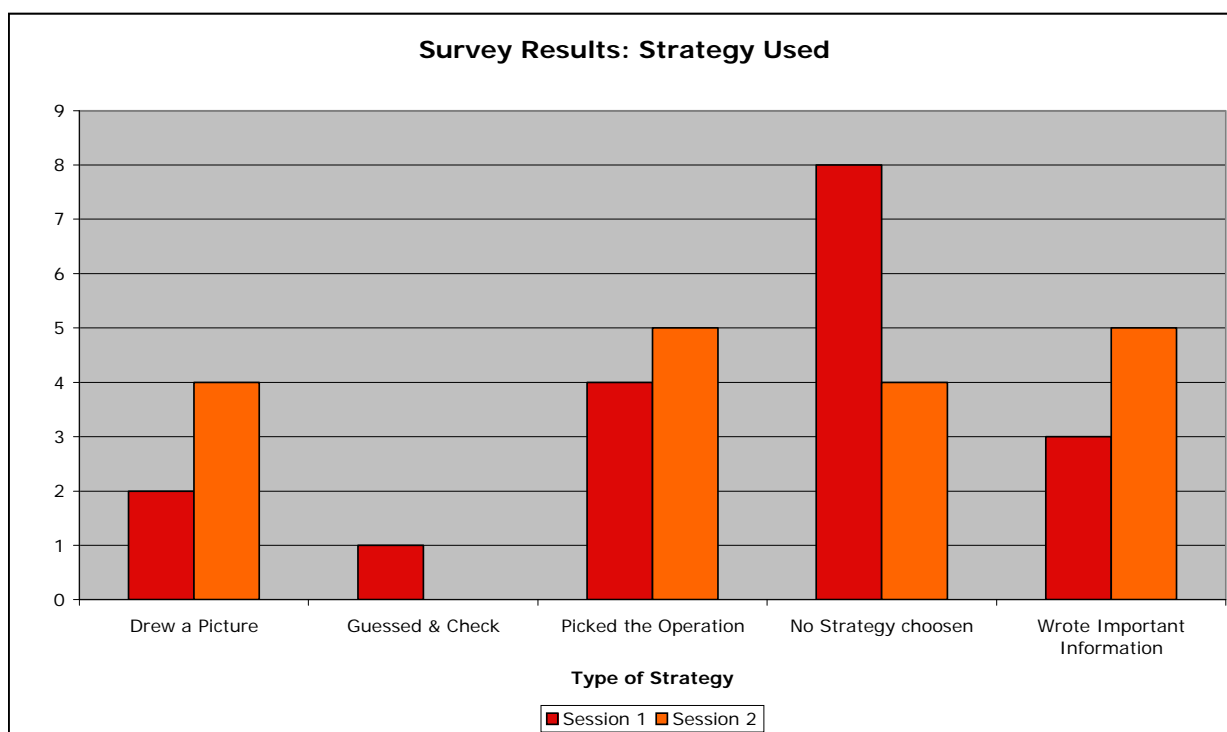


Figure 6. Summary of survey responses for questions 17 through 21 of the survey.

Journal Assignment

At the end of the 4-week study, the students completed a journal assignment that discussed the steps they used to solve word problems (see Appendix C). Responses from the students indicated that they were beginning to explore different ways to solve word problems. The students mentioned that they did not realize there were strategies they could use to help them solve word problems. Many students also commented that they did not like to solve word problems, however, they felt more comfortable after working on word problems over the course of the study.

Conclusions and Recommendations

Conclusions

Based on the results of the study, presenting students with daily word problems is a beneficial practice. Through the increased exposure, students gradually began to

increase the number of word problems they answered correctly. More importantly, the students began to formulate and apply strategies to help them solve the word problems. Not only will the strategies help the students solve mathematical word problems, but the students can also apply the strategies towards other problem-solving situations. The journal responses indicated that the students found learning the strategies beneficial. Some students stated they used a strategy, such as drawing a picture, but they did not realize it was considered a strategy.

The overall project was successful and the results provided a positive trend towards incorporating the daily use of word problems in the classroom. I also realized that the school setting and students contributed to the success of the project. The school has received many local awards and is considered a school of academic excellence. The students were highly motivated and engaged in the project. While the school and students contributed to the success of the project, I feel positive results could be achieved in different environments and with a variety of students.

Based on the literature available and discussions with peers, I would conclude that others in the teaching profession agree that daily use of word problems is beneficial in the mathematics classroom. There are numerous books published each year that provide teachers with word problem warm-up or daily exercises. The books give teachers a plethora of problems from which to choose. Many times, the problems are used to begin the class and engage the students, while, at the same time, giving additional practice, not only on word problems, but other mathematical processes. During the research selection process, I conferred with numerous professionals regarding their opinions on the research. I received positive feedback and support for the research. Many teachers stated

they already incorporated the use of a daily warm-up exercise, which included word problems. As I prepare to begin my teaching career, I plan to incorporate the use of daily word problems with my students.

Recommendations

I would recommend teachers take time to research the benefits of daily word problems in their classrooms. As stated previously, there are numerous books available that provide daily word problems and brainteasers to use each day. Many of the books are broken into sections, based on mathematical topics, which help teachers assign a problem that leads into the topic to be covered in class. The daily exercises not only engage the students in problem-solving activities, but also provide a consistent program for the start of the class.

It was difficult to find a specific grant that completely matched the research, however, I did find that grants were available that would support the research. I found that grant money supported many Web sites that provide teachers with word problems and brainteasers. The Web sites provide teachers another outlet to obtain word problems to use in their classroom. The Web sites are kept current from the money provided by the grant. Utilizing these types of Web sites also incorporates technology. Technology not only can be used to select problems, but students could use technology to help solve problems. There are many Web sites that allow students to complete problems on the site. Intertwining computer-based word problems with traditional word problems can help keep the daily work exciting and different.

I cannot identify any reasons for not using daily word problems, as the benefits seem endless. I plan to use daily word problems to begin my class sessions. I feel that,

not only will the daily word problems engage the students for class, but will begin to teach them problem-solving skills they will use throughout their lifetime.

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Appendix A

Sample Word Problems

1. Jeff had $\frac{3}{4}$ yard of string. He used $\frac{2}{3}$ of the string to tie a package. How much string did he use?
2. Julia lives $\frac{7}{8}$ mile from work. She has walked $\frac{4}{5}$ of the way to work. How far has she walked?
3. Marla bought $\frac{1}{2}$ gallon of milk. She drank $\frac{1}{4}$ of it. How much milk did she drink?
4. Hakeem bought $\frac{3}{4}$ pounds of cheese. He ate $\frac{1}{3}$ of it. How much cheese did he eat?
5. Five-sixths of a room is now painted. Carlos did $\frac{2}{5}$ of the painting. How much of the room did he paint?
6. The lawn is $\frac{1}{2}$ mowed. Melinda did $\frac{2}{3}$ of the mowing. How much of the lawn did she mow?
7. A lawn mower uses $\frac{3}{4}$ gallon of fuel each hour. How much fuel will it use in $\frac{1}{2}$ hour?
8. A boy weighs 60 pounds on Earth. He would weigh only $\frac{1}{6}$ of that on the moon. How much would he weigh on the moon?
9. A dog weighs 20 pounds on Earth. It would weigh only $\frac{2}{5}$ of that on Mars. How much would the dog weigh on Mars?
10. A rock weighs 10 pounds on Earth. It would weigh only $\frac{7}{8}$ of that on Venus. How much would it weigh on Venus?
11. Zoe spent $\frac{2}{3}$ hour doing homework. She spent $\frac{3}{4}$ of this time reading. How long did she spend reading?
12. In one hour a machine can produce $\frac{9}{10}$ pound of silver. Suppose the machine breaks down after $\frac{1}{3}$ hour. How many pounds of silver are processed?
13. A large box of Lotsa-clean detergent weighs $6\frac{3}{4}$ pounds. There are 12 of these boxes in a carton. How much would a carton weigh?
14. Chloe gained 3 pounds in six months. Matt gained $3\frac{1}{9}$ times as many pounds as Chloe. How many pounds did Matt gain?
15. To make green paint. Andrea mixed $\frac{7}{8}$ quart of yellow paint and $\frac{1}{2}$ quart of blue paint. How much green paint did she make?
16. Maureen bought $\frac{3}{4}$ pound of cheese. Chang bought $\frac{1}{2}$ pound of cheese. How much cheese did they buy?
17. A board $\frac{1}{2}$ inch thick is glued to a board $\frac{3}{8}$ inch thick. What is the combined thickness?
18. Yesterday $\frac{3}{10}$ inch of rain fell. Today $\frac{3}{4}$ inch of rain fell. How much rain fell during the two days?
19. Jennifer spent $1\frac{1}{2}$ hours working on Ms. Thomkin's car on Monday. She spent $2\frac{3}{4}$ more hours on Tuesday to finish the tune-up. How many hours in all did she work on Ms. Thomkin's car?
20. Marissa worked $7\frac{1}{4}$ hours Monday. She worked $9\frac{3}{4}$ hours Tuesday. How many hours did she work in all on Monday and Tuesday?

21. The auto repair shop is $1\frac{3}{10}$ miles from the bank. The bank is $3\frac{3}{5}$ miles from Gina's home. After she left her car at the shop, Gina walked to the bank. Then she walked home. How far did Gina walk in all?
22. It took $2\frac{5}{6}$ hours to fix Mrs. Sax's car. It took $3\frac{1}{2}$ hours to fix Mr. Wong's car. How long did it take to fix both cars?
23. Arlene spent $2\frac{1}{2}$ hours planting part of a garden. It took her $1\frac{3}{4}$ hours to finish planting the garden. How long did it take to plant the garden?
24. A basket weighs $1\frac{1}{8}$ pounds when empty. Jake put $10\frac{1}{2}$ pounds of apples in the basket. How much do the basket and apples weigh?
25. A board $1\frac{3}{8}$ inches thick is glued to a board $1\frac{3}{4}$ inches thick. What is the combined thickness of the boards?
26. A board is 8 feet long. Hank said that this board is $2\frac{1}{2}$ feet too long for the job. How long a board does Hank need?
27. The stakes in Don's croquet set are 2 feet long. He drove one stake $\frac{3}{4}$ foot into the ground. How much of the stake is above the ground?
28. This year Reola spends $5\frac{1}{4}$ hours in school each day. Last year she spent $4\frac{3}{4}$ hours in school each day. How many more hours does she spend in school each day this year than last year?
29. A wire is $4\frac{7}{12}$ feet long. Suppose $1\frac{1}{12}$ foot of wire is used. How much wire would be left?
30. Phillip jogged $\frac{5}{6}$ mile. He walked $\frac{1}{2}$ mile. How much farther did he jog than he walked?
31. Rona and Joan have $\frac{5}{6}$ of a room painted. Joan painted $\frac{1}{5}$ of the room. How much of the room did Rona paint?
32. A rock weighs $\frac{9}{16}$ pound. Suppose $\frac{1}{4}$ pound is chipped away. How much would the remaining rock weigh?
33. It takes Monica $\frac{5}{6}$ hour to get to work. In doing so, she rides the train $\frac{2}{3}$ hour. She walks the remaining time. How much time does she spend walking to work?
34. Mr. Anthony and Mr. Androtti completed $\frac{3}{4}$ of a job. Mr. Androtti completed $\frac{2}{9}$ of the job. What part of the job did Mr. Anthony complete?
35. Mrs. Tanner bought $2\frac{1}{2}$ gallons of paint. She used $1\frac{2}{3}$ gallons of paint on the garage. How much paint did she have left?
36. Allen practiced the guitar $1\frac{1}{4}$ hours today. He practiced $\frac{2}{3}$ hour before lunch. How long did he practice after lunch?
37. Fido weighs $2\frac{5}{16}$ pounds. Spot weighs $4\frac{7}{8}$ pounds. How much more than Fido does Spot weigh?
38. A pail filled with water weighs $9\frac{1}{4}$ pounds. The empty pail weighs $\frac{3}{4}$ pound. How much does the water weigh?
39. John and Mara are reading the same book. John has read $\frac{4}{5}$ of the book and Mara has read $\frac{2}{3}$ of the book. How much more of the book has John read than Mara?
40. Meagan worked $7\frac{1}{2}$ hours. Joshua worked $5\frac{3}{4}$ hours. How much longer than Joshua did Meagan work?
41. Mr. Wakefield used $8\frac{1}{4}$ gallons of water to fill 2 tanks. He put $3\frac{7}{8}$ gallons in one tank. How much water did he put in the other tank?

42. During the month of February, Pete watches the stars on $\frac{2}{7}$ of the nights. How many nights does he stargaze?
43. Cameron spends $\frac{2}{3}$ of an hour each day in his garden. He spends $\frac{1}{2}$ of the time watering the plants. How much time does Cameron spend watering the plants each day?
44. Sari has $\frac{3}{4}$ cup of plant food. She pours $\frac{1}{3}$ cup on one tray of plants. How much plant food is left?
45. Charlie is playing a CD that takes $\frac{4}{5}$ hour to play. He has listened to $\frac{2}{3}$ of it. In minutes how long has he been listening to the CD?
46. There are 30 stanzas in the school play. Meaghan has memorized $\frac{2}{3}$ of them so far. How many stanzas has she memorized?
47. Arthur uses a $5\frac{3}{4}$ foot board for the top of a desk. If he shaves $\frac{1}{12}$ foot from each side of the board, how wide will the desk be?
48. Pete has 21 new baseball cards. Of these, $\frac{1}{3}$ are Red Sox players. How many of Pete's new baseball cards are not Red Sox players?
49. Amanda is building a 3-D puzzle of a castle. There are 650 pieces in the puzzle. If she puts together $\frac{3}{5}$ of the pieces, how many more pieces will she need to put together?
50. Andy likes to build furniture. He has a 36-inch board to cut into 3 shelves. After cutting the board, he shaves $\frac{3}{8}$ inch off each shelf. How long is each shelf?

Sample Problem Answers

1. $\frac{1}{2}$ yard
2. $\frac{7}{10}$ mile
3. $\frac{1}{8}$ gallon
4. $\frac{1}{4}$ pound
5. $\frac{1}{3}$ of the room
6. $\frac{1}{3}$ of the lawn
7. $\frac{3}{8}$ gallons of fuel
8. 10 pounds
9. 8 pounds
10. $8\frac{3}{4}$ pounds
11. $\frac{1}{2}$ hour
12. $\frac{3}{10}$ pound
13. 81 pounds
14. $9\frac{1}{3}$ pounds
15. $1\frac{3}{8}$ quarts
16. $1\frac{1}{4}$ pounds
17. $\frac{7}{8}$ inch
18. $1\frac{1}{20}$ inches
19. $4\frac{1}{4}$ hours
20. 17 hours
21. $4\frac{9}{10}$ miles
22. $6\frac{1}{3}$ hours
23. $4\frac{1}{4}$ hours
24. $11\frac{5}{8}$ pounds

25. $3\frac{1}{8}$ inches
26. $5\frac{1}{2}$ feet
27. $1\frac{1}{4}$ feet
28. $\frac{1}{2}$ hour
29. $3\frac{2}{3}$ feet
30. $\frac{1}{3}$ mile
31. $\frac{19}{30}$ of the room
32. $\frac{5}{16}$ pound
33. $\frac{1}{6}$ hour
34. $\frac{19}{36}$ of the job
35. $\frac{5}{6}$ gallon
36. $\frac{7}{12}$ hour
37. $2\frac{9}{16}$ pounds
38. $8\frac{1}{2}$ pounds
39. $\frac{2}{15}$ of the book
40. $1\frac{3}{4}$ hours
41. $4\frac{3}{8}$ gallons
42. 8 nights
43. $\frac{1}{3}$ hours
44. $\frac{5}{12}$ cup
45. 32 minutes
46. 20 stanzas
47. $5\frac{7}{12}$ feet
48. 14 cards
49. 260 pieces
50. $11\frac{5}{8}$ inches

Appendix B

Solving Word Problem Strategy Survey

Yes: Yes, I did this.

No: No, I didn't do this.

Before you began to solve the problem, what did you do?

- | | |
|---|-----|
| 1. I read the problem more than once. | YES |
| NO | |
| 2. I thought to myself, do I understand what the problem is asking me? | YES |
| NO | |
| 3. I tried to put the problem into my own words. | YES |
| NO | |
| 4. I tried to remember if I had worked a problem like this before. | YES |
| NO | |
| 5. I thought about what information I needed to solve the problem. | YES |
| NO | |
| 6. I asked myself, is there information in the problem that I don't need? | YES |
| NO | |

As you worked the problem, what did you do?

- | | |
|---|-----|
| 7. I thought about all the steps as I worked the problem. | YES |
| NO | |
| 8. I kept looking back at the problem after I did a step. | YES |
| NO | |
| 9. I had to stop and rethink a step I had already done. | YES |
| NO | |
| 10. I checked my work step by step as I worked the problem. | YES |
| NO | |
| 11. I did something wrong and had to redo my step(s). | YES |
| NO | |

After you finished working the problem, what did you do?

- | | |
|--|-----|
| 12. I looked back to see if I did the correct procedures. | YES |
| NO | |
| 13. I checked to see if my calculations were correct. | YES |
| NO | |
| 14. I went back and checked my work again. | YES |
| NO | |
| 15. I looked back at the problem to see if my answer made sense. | YES |
| NO | |

16. I thought about a different way to solve the problem.	YES
NO	

Did you use any of these ways of working the problem?

17. I drew a picture to help me understand the problem.	YES
NO	

18. I “guessed and checked.”	YES
NO	

19. I picked out the operations I needed to do this problem.	YES
NO	

20. I felt confused and could not decide what to do.	YES
NO	

21. I wrote down important information.	YES
NO	

Appendix C

Journal Assignment

Describe the steps you take to solve word problems. Include any techniques that help you solve word problems.

PERCEPTIONS OF ISS IN MODYFING BEHAVIORS

Perceptions of Faculty and Administration
on the Effectiveness of In-school Suspension for the
Modification of Student Behavior

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Education 590, Spring 2007

The University of Tennessee at Chattanooga

*The Institutional Review Board of The University of Tennessee at Chattanooga
(FWA00004149) has approved this research project 07-051.*

Introduction to the Problem

Education scholars often debate the issue of suspension as an education disciplinary tool. An article in the March 2004 issue of *NEA Today* explored the debate of whether out-of-school suspension (OSS) should be stopped altogether ("Should we suspend," 2004). The proponents of stopping OSS stated that they felt students viewed OSS as a vacation away from school, since the students did not have to wake up early to attend school, had no schoolwork sent home with them, and, often times, received no punishment from their parents while at home.

According to the research of Sullivan (1989), in-school suspension (ISS) has become widely accepted by school officials and parents as a favorable substitution for OSS. The increased use of ISS would seem to imply that use of this program is effective. However, there is a lack of viable data which supports that ISS is an effective incentive for students to modify their negative behaviors. A review of literature actually supports a finding that many ISS programs result in higher in-school suspension recidivism, which may indicate that ISS does not assist in behavior modification. Repeated evidence was found that students who are assigned to ISS repeat the exact negative behaviors that, previously, resulted in the ISS referral.

While teaching at a north Georgia middle school as a substitute teacher, I began to notice that the same students were being repeatedly assigned to ISS. On any given day, 2-10 students were placed in ISS, and, for half of these students, this was a repeat placement. This high recidivism rate made me question how effective the ISS program was in modifying student behavior.

Purpose of the Case Study

The purpose of this action research project is to evaluate the effectiveness of the ISS program for the modification of student behavior at this middle school, as perceived by faculty and administration. The overall goal of this evaluation is to provide data on the effectiveness of the program so that the school administration will be able to improve the program.

Justification of the Case Study

Due to the conflicting research on ISS programs, the high number of repeat referrals, and the daily usage of in-school suspension as a disciplinary tool, the effectiveness of the middle school's ISS program needs to be investigated and evaluated.

Guiding Questions

1. How do teachers and administration perceive the ISS program?
2. Is the recidivism rate indicative of ineffective behavior modification?
3. Does student behavior, after time spent in ISS, improve when the student returns to the regular classroom?
4. Is ISS an effective incentive for students to behave appropriately?
5. Is the ISS program wholly punitive, academic, or therapeutic in nature?
6. Is ISS more of a respite from disruptive students than an effective behavior modification tool?
7. Is the problem ISS as a whole or is the problem more specific to the design of the middle school's ISS program?
8. Do the teachers and administrator's feel that therapy is an important part of the ISS program?

Definition of Terms

1. In-School Suspension (ISS): Denial of a student's right to attend their classes for a limited time, during which the student attends class in a behavioral management program held on school premises and during regular school hours.
2. Out-of-School Suspension (OSS): Denial of a student's right to attend school for a limited time, which is usually at least 1 day.
3. Expulsion: Denial of a student's right to attend school for a limited time, which is usually at least 10 consecutive school days or, sometimes, on a permanent basis.
4. Recidivism: A student repeating an undesirable or negative behavior after he or she has received negative consequences for that behavior.
5. Effective: Faculty and administration responding positively to eight or more items on the questionnaire, regarding their perceptions of the effectiveness of the ISS program at the middle school.

Review of Literature

Development of ISS as a Discipline Tool

"Zero tolerance," No Child Left Behind Act (NCLB), and the Gun-Free School Act of 1994, are all policies that have played a significant role in school discipline by redefining what student actions require suspension as punishment (Taras, Frankowski, McGrath, Mears, Murray, & Young, 2003; Christle, Nelson & Jolivette, 2004). The use of suspension as a disciplinary tactic was in direct response to the real and perceived threats to the safety of those in the school environment. After the violence that erupted at Columbine High School, policies were put into place to deter similar violent actions. The Gun-Free Act that President Clinton signed into law in 1994 mandated that any student

caught with a gun at school should receive a 1-year expulsion (Breunlin, Cimmarusti, Bryant- Edwards, & Hetherington, 2002). In response to this law, schools set zero-tolerance policies. These policies stated that expulsion would be given to any student who performs any act of violence. But expulsion and out-of-school suspension were not the best solutions for every infraction of the rules, and, as a result, in-school suspension began to gain favor as a disciplinary tool. The NCLB Act further strengthened the foothold for ISS as it drew the school administrator's attention to the problem of absenteeism, both voluntary (students not attending school of their own volition) and involuntary (students who were absent due to expulsion or out-of-school suspension). Today, students who commit lesser infractions of the rules are, therefore, often referred to ISS as a disciplinary measure (Morrison, Anthony, Storino, & Dillon, 2001).

Characteristics of Effective ISS programs

According to the research of Morris and Howard (2003), there were five initial characteristics that were common to some of the first effective ISS programs, and are still generally used in today's programs. The first involves isolation of the students from the rest of the student body. Secondly, lunches are eaten separate from the rest of the student body. The third characteristic is a time limit, often 3 to 5 days, in which the student remains in ISS. Fourth, while in ISS, talking is not permitted and privileges are not given. Finally, regular classroom assignments are to be completed while in ISS.

In-school Suspension Models

Generally, ISS programs follow one of three models: punitive, academic, or therapeutic (Morris & Howard, 2003). The punitive model usually includes highly restrictive rules, which sometimes includes limited restroom breaks and no talking. The

students spend the entire assigned time (from 2 to 10 days) within the confines of the ISS room or performing punitive cleaning details around the school. According to Sheets (1996), this method is used most commonly in schools and is based on the assumption that the punishment of ISS will be enough of an incentive to deter students' negative behaviors.

The second model, academic, is centered on performing tests that measure academic skills. Appropriate academic goals and tutoring are then given to the students. Students also received individualized instruction (Morris & Howard, 2003). This model is based on the premise that students are frustrated academically and are exhibiting this frustration through acts of misbehavior (Sheets, 1996).

Finally, in the therapeutic model, the goals are to address students' self-esteem issues, communication skills, and social skills (Morris & Howard, 2003). Counseling is used to address these issues and the underlying idea is that counseling sessions will help to improve student behavior by teaching the appropriate behaviors (Sheets, 1996).

Sheets (1996) also suggested a fourth model, individual, in which the other three models are combined, but it also includes an evaluation of the student. This component is used to look at the various reasons that each individual student is exhibiting negative behaviors.

The Goals of Effective ISS programs

Research has often shown that ISS programs fall short of their goals and do not appear to meet the needs of the students academically, therapeutically, or socially (Chung & Paul, 1996). The results of many inquiries into ISS share common concerns about the

development of an effective program, which is expressed in the following statement by Chung and Paul (1996):

In-school Suspension is a widely used policy and can have positive effects if there is a great deal of consideration about how it is to be implemented.... The ISS policy must include clear guidelines and goals and a staff which provides support for students who are in a position of risk. (p. 15)

In reviewing the literature, successful in-school suspension programs have a paradigm that includes being academically-oriented and therapy-centered, and they also tend to follow the recommendations set by other "model" ISS programs (Vanderslice, 1999). Siskind (1989), Vanderslice (1999), and Whitfield and Bulach (1996) all agree that certain aspects are key in the development of an effective ISS program.

First, the rules and procedures of the ISS program need to reflect the overall educational policy of the school. Another key element includes the instructor of the ISS classroom, who needs to be certified with a background in counseling or a related field (Siskind, 1993; Vanderslice, 1999; Whitfield & Bulach, 1996). Other important elements include the ISS room being located away from the regular classroom, as well as ISS students eating lunch away from the rest of the student body (Siskind, 1993).

One area, in which several of the authors agreed, was on the importance of student counseling in ISS (Chung & Paul, 1996; Siskind, 1993; Vanderslice, 1999; Whitfield & Bulach, 1996). This counseling can occur on an individual basis, as well as through group therapy, and it is considered essential to the success of behavior modification and ISS, as a whole. Vanderslice (1999) added that regularly scheduled visits by administrators are equally important. However, the authors disagreed as to

whether the ISS instructor or monitor should take an authoritative role (control with explanation), an authoritarian role (complete control with no questions asked), or a permissive approach (very little control by the instructor, with the focus on the students controlling their own behavior) (Chung & Paul, 1996; Siskind, 1993; Vanderslice, 1999; Whitfield & Bulach, 1996).

Evaluating the Effectiveness of ISS Programs

Sullivan's (1989) study of successful ISS programs concluded that there were essential elements that effective ISS programs needed, one of which was an evaluation. Sullivan (1989) suggests that this critical element includes an observation of the ISS program, a review of the behavioral data provided through school records, and an evaluation of student, teacher, and administration perceptions of the program's effectiveness.

Teacher and Administration Perceptions of ISS

Research indicates that subjective factors can affect the use of ISS, such as the school principal's philosophy on disruptive behavior or faculty feeling that student placement in ISS is a welcome respite from a regular classroom disruption. Studies indicate that perceptions and attitudes directly influence the suspension rate within a school (Christle et al., 2004). The perceptions of school administrators and faculty are important to the overall success of the ISS program, but the perceptions of students can play a role, as well.

Student Perceptions of ISS

The study conducted on the effectiveness of ISS in a suburban Atlanta high school discovered that over half of the students preferred ISS to detention and half

preferred OSS to ISS (Whitfield & Bulach, 1996). This shows that detention was considered a worse punishment than in-school suspension, and out-of-school suspension was preferred by students, overall. The students may have been viewing the time away from school as a vacation, rather than a privilege that they were being denied. The students may have also seen detention as more of a punishment, since it extended the school day, rather than simply replacing their regularly scheduled classes.

Since detention is usually given for minor infractions, ISS for more serious infractions, and OSS as the ultimate punishment for negative behavior, the students' ranking of effective punishments reflects a vast difference, and is completely opposite to the administration's intended use of those punishments. This, in turn, raises the question of the effectiveness of all these forms of discipline. Siskind (1993) agreed with this opinion in her study, which revealed similar results and found that the majority of students cited ISS as more punishment than OSS. Vanderslice (1999) makes this statement regarding OSS:

Teachers continually report difficulty with discipline as a major stress in their job. The frustration of dealing with disciplinary problems has driven many teachers out of the classroom.... Both teachers and school administrators agree that discipline is the most serious problem faced by teachers today.... Out-of-school suspension does temporarily seem to free the teacher to better attend to the needs of those students who choose to behave. However, it also seems evident that the policy of awarding vacations for bad behavior is transparently ridiculous even to the adolescents themselves and certainly does not lessen discipline problems when they return. (p. 2-3)

Student opinions shed some light on the effectiveness of ISS, but, according to Whitfield (1996), consistent and accurate recordkeeping will also show the effectiveness of an ISS program. In agreement, Siskind (1993) also adds that it is recommended that ISS programs be evaluated annually, with at least one formative evaluation mid-year. Vanderslice (1999) echoes these authors' views, and adds that the evaluation needs to measure, not only that the objectives of the program are being met, but, also, that the students' negative behaviors are changing over time.

Behavior Modification as a Result of ISS

Research done by Morrison et al. (2001) found that there is a high correlation between repeat offenders who enter ISS, grades, self-perceptions, and family conflict. Those students who were repeatedly placed in ISS had grades that ranged between a low "C" and failing. These students also had low self-perception and had experienced extensive family conflict. For students like these, wholly punitive ISS programs will not be as effective as programs that include academic and therapeutic components. Sullivan (1989) notes the importance of a therapeutic component, stating:

The rehabilitative potential of in-school suspension is significantly enhanced when extensive, individualized counseling is conducted with suspended student by persons who have been trained in appropriate guidance techniques, and who are knowledgeable of the student's academic and behavioral history. (p. 34)

Alternatives to ISS

Other concerns exist that student placement in ISS is too often prejudicial, subjective, and wholly punitive in nature. Two authors, Ediger (2002) and Sanders

(2001), have suggested alternatives to ISS. Both authors agree that students don't always get the support they need to improve their behavior. Ediger (2002) suggests that using behaviorist techniques, such as positive reinforcement, as well as implementing a routine of identifying and resolving problems through action research, are both proactive alternative ways for dealing with student discipline problems. Ediger (2002) also suggests using a time-out area in the classroom for disruptive students.

Sanders (2001) agreed with Ediger on the power of positive reinforcement to change behavior. Sanders (2001) suggests implementing a new program in place of ISS. The program is the Student Advisory Center (SAC), and it is based on the principle of positive reinforcement. This program focuses on teaching students how to improve their self-esteem, change their behavior, and improve their grades.

Data Collection and Results

The purpose of this action research project is to evaluate the effectiveness of the ISS program at the middle school, as perceived by faculty and administration. To evaluate these perceptions, two questionnaires have been given to administration and faculty. The review board at The University of Tennessee at Chattanooga approved this investigation before its implementation.

Subjects

The population who received the questionnaires consisted of 96 teachers, 1 principal, and 3 assistant principals.

The socioeconomic make up of the student body ranges from government housing to upper-middle-class housing, with a median income of \$41,340. Manufacturing companies (mostly carpet mills) make up 47.3% of the industries providing employment.

The student body is 62% Hispanic, 8% Black, 26% White, and 4% Other. The school serves 1,311 students in grades 6 through 8 (Great schools, n.d.; Public School Review, n.d.).

Instrumentation

A 15- question, online questionnaire was given to all 96 teachers and 4 administrators via email access. The questionnaire was designed using a five-point Likert scale and open-ended questions to collect data on faculty and administrative perceptions regarding the effectiveness of the ISS program. Participants rated whether they strongly agreed, agreed, were neutral, disagreed, or strongly disagreed with the statements presented in the questionnaire.

Procedures

Participation of all 96 faculty and 4 administrators was requested, via email. Participants were asked to respond to the anonymous, online survey, designed to examine their views of the ISS program. The anonymous participant responses were collected in the online survey program and were analyzed. Responses to rated questions for both the faculty survey and administrator survey were calculated and the results are illustrated in a table format. Open-ended responses were grouped together using thematic analysis and narrative descriptive. The individual responses to these questions are also provided in Appendix D. The responses of "4" and "5" (agree and strongly agree, respectively) will be combined into one column and labeled "agree" the responses of "2" and "3" (disagree and strongly disagree, respectively) will be combined into one column and labeled "disagree". The "1" represents a response of "not applicable or neutral."

Expenses

The online survey program for SurveyConsole.com required a monthly fee of \$15.00. There were no other expenses associated with the distribution of the questionnaires.

Limitations

Due to delays in the approval process for this study, and the resulting limited time constraints, the original design of this study was modified. As Sullivan (1989) suggested, evaluations of ISS programs should include an observation of the ISS program, a review of the behavioral data provided through school records, and an evaluation of student, teacher, and administration perceptions of the programs effectiveness.

The original design of this study included a student questionnaire that explored students' perceptions of ISS. It also included an observation of the ISS room to evaluate whether the program is punitive, academic, or therapeutic in nature. Also, according to Whitfield and Bulach (1996), consistent and accurate recordkeeping will show the effectiveness of an ISS program. So, in addition to the questionnaires and observation, behavioral referral forms were to be compared to see if the number of occurrences of misbehavior decreased, increased, or stayed the same, after the student has spent time in ISS. These are still areas of the evaluation that I would like to conduct, at a future time, as I feel they are essential to a comprehensive evaluation of this ISS program, not only to ensure the objectives of the program are being met, but that students' negative behaviors are changing over time, as well.

Other limitations encountered include a low response rate on the questionnaires. Of the 96 teachers, 44 teachers completed the faculty questionnaire. Of four

administrators, two completed the administrator's questionnaire. The respondent rate was 46%, which raises some concerns about whether this study could be generalized to other populations. No demographic information was collected on the respondents so there is no way to discern if the respondents are similar to the total sample.

Results

This study contained both quantitative and qualitative aspects. The quantitative data is shown in Figure 1, and represents the responses on the Likert scale questionnaire. The qualitative data consists of the responses to the open-ended questions. The open-ended responses were grouped using themed analysis, and are paraphrased according to these themes. The full narrative responses are provided in Appendix D.

Quantitative Data

Faculty responses indicated that 95.45% of the respondents felt that the time a disruptive student spends in ISS is a respite for the teacher and other students, rather than an experience that will modify the disruptive student's behavior. Administrator responses indicated that both respondents were neutral on this item. In addition, 90.91% of the faculty respondents and 100% of the administrator respondents felt that the same students returned to ISS for the same misbehaviors, which would indicate that both faculty and administration feel that placement in ISS, alone, will not modify the student's negative behaviors.

However, when asked whether the main focus of ISS should be academic, therapeutic, or punitive, there were mixed results. The majority of the faculty respondents, 63.63%, agreed that the main purpose of ISS should be therapeutic, aiming to correct the student's attitudes and behaviors. Still, 59.09% felt that the main purpose of

ISS should be to punish students for their negative behaviors. Only 25% of the faculty respondents felt that ISS should have an academic purpose. In contrast, one of the administrator respondents felt the main purpose should be punitive, while the other felt the main purpose should be academic. Although the majority of those surveyed felt that therapy should play a major role in ISS, they also felt that the program should remain punitive, as well.

Overall, the response of faculty participants (45.46%) indicates that almost half of the respondents do not feel that the ISS program at the middle school is effective in modifying student behaviors. Again, this was in slight contrast to the administrator responses; one respondent felt the ISS program is effective and the other respondent felt that it is not.

This is not to say that the respondents felt that, in general, in-school suspension as a program for dealing with discipline issues is not effective. Rather, it indicates that they felt the program at the middle school was not effective. In fact, 41.86% of the faculty respondents did feel that ISS was an effective discipline tool.

For the purposes of this study, *effective* was defined as faculty and administration responding positively to eight or more items on the questionnaire. The average positive response was five items on the questionnaire, indicating that the majority of those who responded did not feel that the middle school's ISS program is effective in modifying student behaviors, as is evidenced in Figure 1.

Educator Perceptions of ISS Effectiveness

Responses	n/percentage		
	Agree	Neutral	Disagree
<i>Faculty^a</i>			
1. The time spent in ISS improves student attitudes and behaviors once the student returns to the regular classroom.	9 20.45%	10 22.73%	25 56.82%
2. When disruptive students are in ISS, that time provides a break for the other students and the teacher, rather than improving the disruptive student's behaviors.	42 95.45%	2 4.55%	0 0.00%
3. The main purpose of ISS should be to punish students for their negative behaviors.	26 59.09%	7 15.91%	11 25.00%
4. The main purpose of ISS should be to help students academically, which will result in improving student behaviors.	11 25.00%	12 27.27%	21 47.73%
5. The main purpose of ISS should be therapeutic, aiming to correct student's attitudes and behaviors.	28 63.63%	6 13.64%	10 22.73%
6. When a student misbehaves, he or she should be punished.	35 79.55%	4 9.09%	5 11.36%
7. When a student misbehaves, the root of the misbehavior should be investigated to see if it is academic or therapeutic in nature.	36 81.82%	4 9.09%	4 9.09%
8. Overall the ISS program at the middle school is effective.	11 25.00%	13 29.54%	20 45.46%
9. ISS is an effective method of dealing with discipline problems.	18 41.86%	11 25.00%	15 33.14%
10. Once a student has spent time in ISS he/she will probably not return to ISS within the same school year.	4 9.09%	1 2.33%	39 88.58%
11. The same student(s) often return to ISS, for the same or similar misbehaviors.	40 90.91%	1 2.33%	3 6.76%
<i>Administrators^b</i>			
1. The time spent in ISS improves student attitudes and behaviors once the student returns to the regular classroom.	1 50.00%	0 0.00%	1 50.00%
2. When disruptive students are in ISS, that time provides a break for the other students and the teacher, rather than improving the disruptive student's behaviors.	0 0.00%	2 100.00%	0 0.00%
3. The main purpose of ISS should be to punish students for their negative behaviors.	1 50.00%	0 0.00%	1 50.00%
4. The main purpose of ISS should be to help students academically, which will result in improving student behaviors.	1 50.00%	1 50.00%	0 0.00%
5. The main purpose of ISS should be therapeutic, aiming to correct student's attitudes and behaviors.	0 0.00%	1 50.00%	1 50.00%
6. When a student misbehaves, he or she should be punished.	2 100.00%	0 0.00%	0 0.00%
7. When a student misbehaves, the root of the misbehavior should be investigated to see if it is academic or therapeutic in nature.	1 50.00%	0 0.00%	1 50.00%

8. Overall the ISS program at the middle school is effective.	1 50.00%	0 0.00%	1 50.00%
9. ISS is an effective method of dealing with discipline problems.	0 0.00%	2 100.00%	0 0.00%
10. Once a student has spent time in ISS he/she will probably not return to ISS within the same school year.	0 0.00%	1 50.00%	1 50.00%
11. The same student(s) often return to ISS, for the same or similar misbehaviors.	2 50.00%	0 0.00%	0 0.00%

^aFaculty respondent total is 44. ^bAdministrator respondent total is 2.

Figure 1. Educator perceptions of ISS effectiveness.

The administrators' response to how restrictive the ISS program is at the middle school indicates that both respondents felt it was totally restrictive (students are not allowed to talk). They both also indicated that the ISS teacher's interaction with students is authoritarian in nature (there is complete control without explanation). A key factor in this survey was the administrators' response to the question: What emphasis/focus should the ISS program have? The administrators were asked to rank the importance from 1, which indicated the greatest emphasis, to 3, which indicated the least emphasis. As indicated earlier, one respondent felt the main purpose of ISS should be punitive in nature while the other felt it should be academic.

Qualitative Data

Questions 12, 13, and 14 of the faculty survey and Question 12 of the administrator survey were open-ended questions. The answers were evaluated, categorized, and summarized, with a complete narrative located in Appendix D.

The first faculty open-ended question, number 12, asked for suggestions for improving the in-school suspension program. Each narrative was evaluated and categorized by the theme of the suggestion. There were four main categories that arose:

therapeutic, academic, punitive, or other. Each narrative suggested one or a combination of these components to improve the ISS program at the middle school. The majority of the comments indicated that ISS should include some component of therapy to assist in behavior modification. For example, one respondent stated, “Have students discuss/work on behavior problems with a counselor when they are assigned to ISS. Track their behavior to see if treatment is effective.” The issue of students not completing assignments in ISS and being allowed to sleep in ISS was the next most common addressed issue by teachers. A response that clearly indicates this theme states, “At present, students are allowed to sleep. If work is sent, it is not even briefly checked to see if the student bothers to actually [do the] work...”

The least common theme suggested incorporating more time in which students perform cleaning details around the school (currently those in ISS clean the cafeteria after lunch). One respondent stated the following about students in ISS, “...I feel that they should have some other consequences other than just sitting in a cubicle and reading. To some kids, this is a vacation...having them do jobs like cleaning the bathroom...might help.” Other respondents suggested that, if a student has been assigned to ISS more than once per school year, then an alternative program should be designed for these students. Also some respondents were concerned about the assignment to ISS, and whether it was wholly objective. Respondents made comments such as, “More consistency where students understand exactly what will or will not get you put in ISS...some students get 1 day and some 3 days for similar offenses...does it depend on [the] mood of [an] administrator [or the] mood of [a] certain teacher, etc?” Another respondent stated, “It needs to be assigned more fairly regardless of social status.”

The second faculty open-ended question, number 13, asked what teachers expected students to spend their time doing during ISS. Each narrative was evaluated and categorized by the theme of the suggestion. There were three main categories that arose: involvement in a therapeutic component, completing academic work with ISS instructor support, or other. The majority of the comments indicated that ISS should include some component of therapy in which the students would participate, as well as ensuring that academic work is completed, preferably with the assistance of the ISS instructor. Another suggestion was made that the middle school return to the use of Saturday school and have students perform cleaning details around the school. This respondent states, “Learning to be more constructive, productive citizens. As an example, many years ago, we did ‘Saturday School’ in lieu of ISS or detentions. During Saturday school, students spent a part of the time making up missed work from classes, but also did necessary jobs around the school, such as sweeping, cleaning off tables or windows, things that were productive and constructive, but not demeaning...” Again several respondents noted that students should not be allowed to sleep in ISS or do ‘busy work.’

The last faculty open-ended question, number 14, asked a similar question to number 12 on the administrator’s survey. Both questions asked under what circumstances were students assigned to ISS. Faculty responses included talking back, disrupting class, misbehaviors/inappropriate behaviors, chronic negative behaviors, excessive tardies, truancy, fighting, aggressive behaviors, gang-related activity, harassment, cheating, stealing, vandalism, and an accumulation of demerits.

There was no consensus as to how many demerits result in assignment to ISS. The responses often ranged from 10 to 14 demerits, with some respondents stating they did

not know how many, nor did there seem to be a consistent number of demerits that might require a student to attend ISS. For example, one respondent states, “So many demerits is SUPPOSED TO = ISS time but it doesn’t always work that way.” Another respondent shared the same sentiment and states, “There’s supposed to be a certain number of offenses which will earn a student time in ISS. However, I don’t see the connection...most teachers feel that students can earn a huge number of demerits without ever receiving ISS, so they’ve basically stopped issuing demerits.”

When the faculty was asked if ISS programs were used too often or not enough, 73.68% felt that the program was not used enough. However, since the option “just enough” was not given, this percentage may not reflect the true perceptions regarding this statement.

Conclusions and Recommendations

The purpose of this action research project was to evaluate the effectiveness of the ISS program in modifying student behaviors at a middle school in north Georgia. The faculty and administration surveys indicate that the ISS program is not very effective. Results showed that there is a high recidivism rate for the ISS program. There are also some indications that there are discrepancies between the perceptions of the administrators and the teachers on what the focus of ISS should be. Data also indicated that the ISS program at the middle school is punitive in nature and student referrals to ISS are not systematic. These results indicate that further investigation is necessary and appropriate to fully evaluate the effectiveness of this program.

Future Evaluations and Recommendations

The evaluation of how students perceive ISS needs to be implemented. Some key questions would include determining if students perceive ISS to be more of a punishment than other forms of discipline programs, such as Saturday school. Also, evaluating student perceptions of the ISS teacher and the ISS program is essential. Other important questions are included in the sample student survey in Appendix C. However, one potential limitation would be that, in order to conduct this portion of the study, permission may need to be granted from student participants and their parents through permission slips. There may be a potential language barrier, as the majority of the Hispanic students' parents speak only Spanish, and 62% of the student body is Hispanic. This communication barrier may affect the participation in this future evaluative process.

Another recommendation would be to have the ISS program observed. This observational approach would be appropriate for assessing the program's characteristics and its role on student behavior. It would also provide the observer with information on what the students do while in ISS. Perhaps students do sleep, and, if so, this may be a problem that should be addressed.

In addition, examining student records to determine recidivism rates would provide an obvious indication of the effectiveness of the program. By comparing the number of behavioral referrals before and after a student has attended ISS, one would be able to determine if behavior modification has taken place.

The conflicting answers among teachers regarding the demerit system and assignment to ISS indicates that, perhaps, an in-service workshop on the program is necessary. The more informed the teachers are about the program, its goals, and its

operation, the better utilized the program will be. Minor and major infractions of the rules need to be established, and students should only be referred to ISS for more serious infractions. A consistent referral process needs to be implemented, with clear indications of what violations can and will result in student assignment to ISS.

A key finding of this study is the lack of academic and therapeutic counseling in the ISS program at the middle school and the high recidivism rate. Research has indicated that a therapeutic component and academic support is essential in effective ISS programs. The literature review suggests that, without counseling, there will be little or no impact on modifying student behaviors.

Conflicting responses regarding what the main purpose or focus is of the ISS program, indicates that the school's philosophy on the ISS program needs to be defined, with clear policies and procedures developed.

Without a regularly scheduled program evaluation, the benefits of ISS cannot be calculated. Siskind (1993) recommended that ISS programs be evaluated annually, with at least one formative evaluation mid-year. Perhaps, a committee could be formed to review data gathered on the ISS program, and, after evaluations, further recommendations for program improvement could be implemented at the middle school.

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Appendix A

Survey for Middle School Faculty

5 = Strongly Agree 4 = Agree 3 = Disagree 2 = Strongly Disagree 1 = Not Applicable

1. The time spent in ISS improves student attitudes and behaviors once the student returns to the regular classroom.
5 4 3 2 1
2. When disruptive students are in ISS, that time provides a break for the other students and the teacher, rather than improving the disruptive student's behaviors.
5 4 3 2 1
3. The main purpose of ISS should be to punish students for their negative behaviors.
5 4 3 2 1
4. The main purpose of ISS should be to help students academically, which will result in improving student behaviors.
5 4 3 2 1
5. The main purpose of ISS should be therapeutic, aiming to correct student's attitudes and behaviors.
5 4 3 2 1
6. When a student misbehaves, he or she should be punished.
5 4 3 2 1
7. When a student misbehaves, the root of the misbehavior should be investigated to see if it is academic or therapeutic in nature.
5 4 3 2 1
8. Overall the ISS program at the middle school is effective.
5 4 3 2 1
9. ISS is an effective method of dealing with discipline problems.
5 4 3 2 1
10. Once a student has spent time in ISS he/she will probably not return to ISS within the same school year.
5 4 3 2 1
11. The same student(s) often return to ISS, for the same or similar misbehaviors.
5 4 3 2 1
12. What suggestions would you make, if any, for improving the DMS in-school suspension program?
13. What do you expect students to spend their time doing in ISS?
14. Under what circumstances have students been assigned to ISS through the demerit system?
15. Is ISS used:
 - a. too often, or
 - b. not often enough

Appendix B

Survey for Middle School Administration

5 = Strongly Agree	4 = Agree	3 = Disagree	2 = Strongly Disagree	1 = Not Applicable
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1. The time spent in ISS improves student attitudes and behaviors once the student returns to the regular classroom.
5 4 3 2 1
2. When disruptive students are in ISS, that time provides a break for the other students and the teacher, rather than improving the disruptive student's behaviors.
5 4 3 2 1
3. The main purpose of ISS should be to punish students for their negative behaviors.
5 4 3 2 1
4. The main purpose of ISS should be to help students academically, which will result in improving student behaviors.
5 4 3 2 1
5. The main purpose of ISS should be therapeutic, aiming to correct student's attitudes and behaviors.
5 4 3 2 1
6. When a student misbehaves, he or she should be punished.
5 4 3 2 1
7. When a student misbehaves, the root of the misbehavior should be investigated to see if it is academic or therapeutic in nature.
5 4 3 2 1
8. Overall the ISS program at the middle school is effective.
5 4 3 2 1
9. ISS is an effective method of dealing with discipline problems.
5 4 3 2 1
10. Once a student has spent time in ISS he/she will probably not return to ISS within the same school year.
5 4 3 2 1
11. The same student(s) often return to ISS, for the same or similar misbehaviors.
5 4 3 2 1
12. What types of student behaviors/offenses result in the student being placed in ISS?
13. How restrictive is the ISS Program? 1=not restrictive (students can talk freely with each other and the teacher)
2=somewhat restrictive (students can talk at the teacher's discretion) 3=totally restrictive (student are not allowed to talk)
1 2 3
14. What type of interaction does the ISS teacher have with the students assigned to ISS? 1=permissive (there is little control) 2=authoritative (there is control with explanation) 3=authoritarian (there is complete control without explanation)
1 2 3
15. What emphasis/focus should the ISS program have? 1=greatest emphasis/focus 3=least emphasis/focus
punitive (ISS should be for punishment as a result of student offenses) _____
academic (ISS should be for punishment, as well as academic support) _____
therapeutic (ISS should be for counseling/guidance to assist in behavior modification) _____

Appendix C

Suggested Sample Survey for Middle School Students

3 = Agree	2 = Neither Agree or Disagree	1 = Disagree
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1. Spending time in ISS makes students behave better when they come back to the regular classroom.
3 2 1
2. If I had a choice, I would choose ISS over after-school detention.
3 2 1
3. If I had a choice, I would choose out-of-school suspension over ISS.
3 2 1
4. If I had a choice, I would choose Saturday school over ISS.
3 2 1
5. The main purpose of ISS is to punish students for their negative behaviors.
3 2 1
6. The main purpose of ISS is to help students with their schoolwork.
3 2 1
7. The main purpose of ISS is to help students with their personal problems.
3 2 1
8. Students in ISS receive a lot of help from the teacher in charge of ISS.
3 2 1
9. I feel that the teacher in charge of ISS cares about what happens to students.
3 2 1
10. I know students who have been placed in ISS.
3 2 1
11. How well does ISS work? 1= very poorly 2=okay 3= very well
1 2 3
12. What do most students do during their time in ISS?
13. What kinds of behaviors will get students placed in ISS? (be specific)
14. Have you ever been placed in ISS? Yes No How many times? _____
15. Is ISS used:
 - a. too often, or
 - b. not often enough

Appendix D

Faculty Open-ended Responses

Question 12:

What suggestions would you make, if any, for improving the middle school in-school suspension program?

1. Have students discuss/work on behavior problems with a counselor when they are assigned to ISS. Track this behavior to see if treatment is effective.
2. I am not sure, but I feel that they should have some other consequences other than just sitting in a cubicle and reading. To some kids, this is a vacation. I know legally they can't work but having them do jobs like cleaning the bathrooms (which they are responsible for writing on the walls) might help
3. First of all, students need to understand the reason/s why they were placed in ISS and work on remediating those areas before returning to class. Secondly, they need to held accountable for their missed class assignments; ensuring that the work they do is quality work. Thirdly, another alternative should be used if the students are assigned to ISS more than once per school year.
4. I would suggest some sort of curriculum that deals with helping the students determine what causes their behavior.
5. possibly add some kind of behavior improvement course work which must be completed and defended (by student) before release back into the mainstream student body
- 6.
7. i would suggest having required counseling sessions for repeat offenders in ISS.
8. certified person who cares about the students academic, behavioral, and emotional needs; computer program academic program rather than paper and pencil
9. I would suggest they had to do ISS work, not work they would have gotten in class. Then they would have to make up what they missed in class. Not use it for time to do assignments they should be getting in class.
10. attach more behavior based incentives to prevent repeat occurrences.
11. I would like to see more attention spent on correcting student behavior rather than assigning classwork. Students generally do not understand assignments and can not recieve individual instruction during time served.
- 12.
13. no sleeping allowed
14. Something more constructive than a simple 'Time-Out' -- perhaps a work program half of the day, similar to what they do following lunch. Include a mandatory 'counseling' session with each day in ISS.
15. Students should not be allowed to sleep while in ISS.
16. It needs to be assigned more fairly regardless of social status
17. students should remain in ISS until they complete all their work instead of getting out and taking a zero. i think if they had to really work, do all their work, then they might want to avoid the place. but this would require teachers to have plans in place to give students when they get in trouble.
18. more consistency where students understand exactly what will or will not get you put in ISS.....some students get 1 day and some 3 days for similar offenses....does it depend on mood of administrator, mood of certain teachers, etc,...???
- counselors need to work more with students who have been sent to ISS to encourage substantive reflection and connection with cause/effect....
- 19.
20. HAVE A TIME-OUT ROOM: SOMETIMES STUDENTS JUST NEED TO GET CONTROL AND THEN THEY CAN FUNCTION IN THE CLASSROOM
- 21.

22. Make it more effective. Not just a hold cell.
Reading group.
Therapy type, pro-behavior type
23. Make it a place where they don't want to be. Too many kids could care less if they are in ISS or not.
24. I like the program
- 25.
- 26.
27. No sleeping allowed.
Have a facilitator who will help with work.
Not out of ISS until all classwork is completed.
28. At present, students are allowed to sleep. If work is sent, it is not even briefly checked to see if the student bothers to actually work, or just threw down answers. If the student gets the work back immediately, he might just realize he has authority in that room. I have received math work back, where the student(s) just throw down numbers. I think this should have been caught and the ISS authority make it clear student(s) will do work effectively.
- 29.
- 30.
31. ISS should be extremely uncomfortable for students. The time they spend there should be miserable.
32. Punishment may very well serve to decrease behaviors, but it may increase the need for punishment. Consequences are essential - but they don't necessarily need to be 'punishment.' Consequences can involve separation from the mainstream to protect the safety of 'self' and others - self meaning the offender. Others is defined as potential victims. Instead of doing busy work, the students should participate in constructive, productive jobs, as well as working on academics.
33. AN alternate school for behavioral problems with some sort of therapy
34. More academic support, more structure
35. Require students to immediately call a parent to let parents know that they are in ISS.
Don't let student's sleep.
Many students do not return after one day in ISS; we have the SAME students in there over and over!
There needs to be something else for repeat offenders.
- 36.
37. Have the person in there actually work with students. I is a great time to help them catch up academically.
- 38.
- 39.
- 40.
41. Student work should be finished as assigned to be completed. This year, most students are completing their assignments in ISS. A few in ISS never complete an assignment. Students should work in ISS.
- 42.
43. Teachers should be able to send students straight to ISS for major infractions like fighting. Sometimes fighters do not get seen the same day!
44. Teachers often do not send work. There is little (if any) academic support and little remediation. For most students it is a prolonged timeout. IT is a relatively poor solution except for the teacher. They often sleep

Question 13:

What do you expect students to spend their time doing during ISS?

1. Academic work. Work on behaviors through therapy/counseling. Isolation from friends and activities.
2. I usually try to give them a similar assignment that we are doing in class. They should be trying to learn the same materials that we are discussing. They can't possibly learn alone what should be taught to them in class
3. Working on skills and strategies that will improve the students' behaviors first, and then work on lessons to keep the students from getting behind in their classwork.

4. Classwork and other assignments that help the student re-enter the classroom
5. They are supposed to be completing assignment, but most of the time they appear to be taking a break, getting a nap, etc.....
- 6.
7. academic work
8. reading, academic work (not busy work)
9. Boring work, not sleeping and not being comfortable.
10. They are expected to complete their classroom assignments.
11. Work on behavior modification strategies.
12. Working on any assignments that they could be missing in class.
- 13.
14. After doing their assignments for the day, reading independently or make-up work on past assignments. Not just busy-work.
15. Work and not sleeping
16. Completing assignments and thinking about the behavior that landed them in ISS
17. work they are missing in class.
18. classwork, reflection, plan for future....some students benefit from ISS and don't ever return...some students return often....
19. Study and complete academic work. When they miss my class, it is very hard for them to do a written assignment and have it count.
20. THEY SHOULD BE DOING THE ASSIGNMENTS THEY ARE MISSING IN THE CLASSROOM
- 21.
22. NOT SLEEPING
Doing classwork
Working on corrective action plan with behavior
23. classwork plus something to get to the root of the child's behavior issues
24. Keep up with their classwork. The strict atmosphere also leads to improvement in behavior in the classroom
25. Working on the work they are missing, and catching up on any missing work.
- 26.
27. Classwork.
28. Academic work
- 29.
30. As it is now - They should use the majority of their time completing classwork that they are missing in their classes.
31. I think students should do an ISS curriculum of copying words. These students should not be given the opportunity to do the work the other students in class are doing.
32. Learning to be more constructive, productive citizens. As an example, many years ago, we did 'Saturday School' in lieu of ISS or detentions. During Saturday school, students spent a part of the time making up missed work from classes, but also did necessary jobs around the school, such as sweeping, cleaning off tables or windows, things that were productive and constructive, but not demeaning. During that time, if a student was given detentions for chewing gum, for example, they spent 30 minutes after school scraping gum, and 30 minutes doing homework. I believe that was effective and appropriate. It was more effective and appropriate than putting them in a room, in a small cubicle to do busy work in complete silence with limited restroom breaks and a second-rate lunch. If the student has done something that makes them a threat to themselves or others, ISS is not much more an appropriate placement for them than the regular classroom.
33. Classroom assignments
34. working on assignments or working on basic skills improvement
35. It is awfully hard to send assignments to ISS most of the time. I plan to develop a packet of sorts for students to work on that would help them over the summer.
- 36.
37. Learning!!!! One-on-one instruction should occur.
38. writing notes back and forth between other students; however, they should be completing classroom assignments, learning how to relate to others, and work through their problems.
- 39.

- 40.
41. Students should complete work and work on GPS standards while in ISS.
42. The work they are missing out on in the classroom.
43. Working on what they are missing in class
44. Academic help and support with work

Question 14:

Under what circumstances have students been assigned to ISS through the demerit system?

1. Talking back, disrupting class, skipping class, fighting, accumulating 10 or more demerits.
2. An accumulation of a particular number of demerits is supposed to land you in ISS
3. Accumulation of 10 or more demerits
4. All circumstances
5. tardies, misbehavior, off limits
- 6.
7. too many to list.
8. misbehaviors that continue; fighting; aggressive behaviors; truancy
9. Various reasons to provide an alternate setting for inappropriate behaviors.
10. Not done very much at this campus
11. Unsure
- 12.
- 13.
14. pretty much any behavior or repeated offenses adds toward ISS, but some situations (fighting, cheating, harassment) seem to go straight to jail, do not pass go, do not collect \$200... no anything else.
15. various
16. ISS should be assigned after a major infraction of the rules or after an accumulation of minor problems
17. too many detentions, fighting, skipping school, etc.
18. There's supposed to be a certain number of offenses which will earn a student time in ISS. However, I don't see the connection.....most teachers feel that students can earn a huge number of demerits without ever receiving ISS, so they've basically stopped issuing demerits.
19. Unsure. Most students treat the demerit system as a joke.
20. WHEN THEY ACCUMULATE ENOUGH, THEY WIND UP THERE.
- 21.
22. Numerical count down
23. don't know
24. Total of demerits for a semester, too much affection in the halls, talking back to teacher, chronic disruption in classroom (# 1)
- 25.
- 26.
27. Chronic behaviors
28. Too many behaviors are assigned demerits and AP council and no other consequences on campus.
- 29.
30. I'm not sure since administrators assign students to ISS, but the policy is to assign students to ISS when they reach a certain # of demerits.
31. I do not know.
32. If a student earns a pre-determined number of demerits, ISS is assigned. Students could be assigned to ISS immediately for a set list of infractions.
33. so many demerits is SUPPOSED TO = ISS time but it doesn't always work that way

- 34. Students have been assigned to ISS for excessive demerits
- 35. Fighting, stealing, having too many demerits.
It is not perfect, but it is all we have at the moment.
- 36.
- 37. Used once they have reached a limit of 11.
- 38.
- 39.
- 40. disruption of class through demerits, fights, writing of tables and in bathrooms.
- 41. I haven't seen many, if any, be assigned to ISS this year through the demerit system.
Students should be assigned demerits for accumulated demerits.
- 42. Principals are the only ones who can assign ISS. It is earned with 14 demerits or straight away depending on the bahvior.
- 43. after a certain number of demerits, but maybe the number is too high and needs to be lowered.
- 44. It can be capricious to a point

Photographs Used in the Classroom to Enhance Children's Literacy Experience

Sean Loftin

Education 590, Spring 2007

University of Tennessee at Chattanooga

The Institutional Review Board of The University of Tennessee at Chattanooga (FWA00004149) has approved this research project 07-014.

Introduction to the Problem

As a photojournalist, I know a picture truly speaks a thousand words. Since beginning my education, I have hoped to use my knowledge of photography in the classroom. We use picture books with students to encourage visualization and higher-order thinking. Photographs are freeze-frame snapshots, as are illustrations in a children's book. They tell stories of subjects, with the photographer as author.

How would implementing photography into the classroom as an art form help enhance children's writing? Would photographs open up areas of discussion, including expanding the vocabulary of children who have limited vocabulary? Would photographs help them "see" what they need to write? The purpose of this study is to evaluate how photographs can enhance creativity and the ability for students to write well.

Review of Literature

"Visual literacy (i.e., the ability to interpret meaning through graphic stimuli) provides an alternative way of knowing and promotes higher order thinking and problem solving abilities" (Anderson & Richards, 2003, p. 442). Using visual literacy to promote writing and reading in the classroom has been part of curriculum conversations for several years. This new form of literacy is not found in every classroom, but is slowly being implemented into curricula through visual art, music, and, even, drama.

With recent emphasis placed on scientific testing in the classroom, art has been considered as less important. Because it cannot be measured by scientific testing, art has found little room in today's curricula (Harste, 2005). However, art is slowly making its way into other subject instruction. Visual literacy skills are an important focus that is

often absent from classroom instruction during the writing process (Millard & Marsh, 2001).

Incorporating various art forms into the classroom is also a method of semiotic instruction. Semiotics is defined, simply, as the study of the relationships between written or spoken signs and their reference in the world.

“Learning with a semiotic approach to literacy enables a learner to develop richer and more complex literacy practices, and allows them to deal more thoughtfully and critically with the images and messages of popular culture” (Cowan, 2006).

Photography is a dynamic system, which uses signs to communicate. Mary Jane Moran and Deborah Tegano (2005) agree that signs have two elements: the signifier, which represents the form (photography), and the signified, which represents the meaning received by viewing the image. Photography is just another form of literacy. Peter Goin (2001, p. 368) argues, “The visual language of photography, which includes elements of light, angle, diagonal line, motion, hue, saturation, tone value, frame of reference, among many, many others, incorporates syntactic order.” This ties photographs back to the semiotic process.

Adding stimulating visuals to the classroom writing process helps students in their writing ability. Research has suggested that adding these visuals to the process increases the child’s ability in story creation and improves the finished product (Olshansky, 1995).

At lower grade levels, visual communication is covered minimally, although educators agree it is better to learn a language at an early age (Oring, 2000). Even Steve Sweitzre (1996, p. 10) argues, “Our primary and secondary educational systems are primarily text-oriented. Most teachers are mystified by the concept of visual literacy.”

Teachers are slowly introducing visual literacy into the classroom, combining it with other forms of literacy, like writing and reading, to spark students' interest in learning to write well and creatively.

This is important because, as Donald Arnstine (2005) points out, writing involves a desire to know more about writing. Some children, when they have learned the technical aspects of writing, also learn to retain a positive outlook about writing. Indeed, some students have demonstrated to educators that arts play a major role in releasing their imaginations (Greene, 2005). My love of writing did not occur until one of my teachers allowed me to expand my imagination into my writing. The subject matter was not dictated to me.

This is not the only course of action, however. Teachers should investigate other options for developing literacy in children. We should be using multiple sign systems in the classroom, and not just written texts (Cairney, 1997). And integrating photographs into classroom instruction of writing can open new avenues for students, helping them to learn this form of literacy. When we limit ourselves in teaching, we begin to limit the student's ability to learn. My knowledge of photography will help me implement this effectively into the classroom and also keep me from getting stuck in the status quo of teaching literacy in my classroom.

Visual art in the classroom can be just as useful for the instruction of reading and writing as the text-centered approach used with basal readers. Piro (2002) argues that many literacy teachers may underuse the art of reading a picture. What is interesting is that art and language arts have elements in common. In the use of art, or, in my case, photographs, the picture conveys meaning just as text from a story.

It is imperative that teachers explore more than one avenue of literacy. Cairney (1997) argues that teachers should investigate other options for developing literacy in children. Educators should use multiple sign systems and go beyond written texts. Using art or photography in literacy instruction also helps teachers tap into some of Gardner's multiple intelligences. Literacy teachers need not focus only on the basics of reading, writing, and listening, but, also, on "seeing."

Photography is just another form of literacy. The five Ws (who, what, when, where, and why) are represented in any given photograph. The photographer, as the author of the photograph, tells a story by using the subject as a "main character." Imagery comes through lines, composition, angle, and lighting. These elements in the photograph are just as important as the subject, because they are the setting and, without them, there is no story. "By looking at pictures to determine how they communicate and elaborate a story's message, children make a smooth transition from image to language" (Piro, 2002, p. 129).

Using photographs in the classroom helps students view and discuss imagery. Modeling this instruction is the most important for students who may not know how to respond to a photograph, when seeing its imagery, composition, or subject matter. Ehrenworth (2003) says that she thinks aloud for her students as she responds to a piece, so that her students can witness the process of dissecting a picture, and experience how it makes the viewer feel.

We should infuse the arts into the learning of our students and into our teaching. Sometimes they (students) can articulate what they see in a visual image more than just text (Ehrenworth, 2003). Students often struggle to find topics while learning to write.

Introducing art, or photographs, would not only bring out creativity in children, but also help them to draw from their personal experiences (Cowan, 2005).

Of course, some teachers are hesitant about including art as part of their curriculum. It can be overwhelming to use a form of literacy in your curriculum without any formal training in that art. Understanding visual literacy can be accomplished with practice, so it can be implemented into the classroom. I received an undergraduate degree in photojournalism, with a minor in writing. I will be pulling from both these areas to teach and train the students using visual literacy.

Students come to visual literacy from varying backgrounds and cultural and socioeconomic biases, and people within these various groups view photographs differently (Moran & Tegano, 2005). Allowing students to write, using photographs that match their cultural or economic background, can enhance their creativity and love of writing.

Data Collection and Results

Instructional Procedure

Participants

The main subjects of my study were fourth-grade students. The school is located in an urban neighborhood, but is a magnet school. A letter and permission slip was sent home to parents regarding using photographs and the method of the curriculum.

All the students will be protected under appropriate ethical guidelines required by The University of Tennessee at Chattanooga. Stories written by students, if useful, will be used without their real name attached.

The demographics of the classroom population was 7 females and 13 males. The racial profile of the room was 1 Asian, 15 African American, and 4 Caucasian students. The students' literacy levels range from first-grade level to middle-school level.

Materials

I used a variety of images, which allowed students to choose a photograph that might fit into their life experience. This life experience differed, depending on race, ethnicity, or socioeconomic status. The images used were from two photographers' portfolios. The images displayed a variety of emotions, and they came from varying locations.

Methodology

I had 1 week to implement my writing lesson using photographs. The first day was used for the preassessed writing sample and an introduction to teaching the students how to "read" photographs. During the prewriting assessment, students were given a stack of photographs. They were all asked to select one photograph and write a story about it. I did not give them any other instructions. I provided three pieces of paper per student, pencils, and the 5"x7" photographs. The students had 30 minutes to write a story about the picture. It could be fictional or nonfictional. At the 25-minute mark, I told the students they had 5 minutes left, and, if they wanted to check their work, they could.

I began the lesson by explaining that a photograph can tell a story, if you know how to read it. I explained that when I was a photographer for a newspaper, I had to take a photograph that could tell as much of a story, as possible. I asked them what makes a story. They responded with a character, a setting, and some of the five Ws (who, what when, where, and why). I modeled how I "read" a photograph. I showed them a

photograph and began picking apart its details. This allowed them to see what I do when I read a photograph. I drew a chart on the board with two columns for responses of “What I think” and “because.” These two columns helped us organize our thoughts about the photograph and the details of that image. The second part of the first day’s lesson was to have students look at another photograph with me. I solicited responses from my students and we completed another table for the second photograph.

The next day’s lesson was procedurally the same as the first day. We all looked at a photograph and used the chart to help record our responses about the details of the photograph. I guided students through three photographs as we “read” them together.

On the third day, we began discussing how we could write a story about the details of a picture. The students knew how to infer from stories read to them, so I used that vocabulary to talk to the students about how we can also infer the story of this photograph. We are essentially becoming the authors of this written story, inferring what we can from the image. While not all inferring is wrong, I modeled how I would infer from a photograph, using factual clues from its details.

I used a “What I know, because” chart and wrote clues from a photograph. I told a story to the class about the photograph I was using, and also wrote some of my sentences on the board. We used an outline format and wrote a simple, one-paragraph story about the image.

On the fourth day, I again brought out a new photograph to show the students. We talked about the story we had written together on the board the previous day. I allowed the students 5 minutes to examine a photo I had chosen, then we examined the photograph together and began an outline from the details gleaned from our observation.

I gave the students time at the end of class to write their own story from a new photograph, and encouraged them to think about the outlines we made to organize our details. This, I told them, would help in their story creation.

The final day of my instruction was a post-writing assessment. The students were allowed to choose their own photograph. I told them that they needed to write a story about their photograph and they could use any prewriting activity we used, such as outlines or charts, to help them organize their details and ideas for a story. After a 10-minute pre-writing time, the students were given 25 minutes to write their stories, and were then given 5 minutes to reread and edit the story.

Data Collection

I used a rubric for both my writing assessments. The rubric was a basic tool made from the Rubistar (2006) Web site. Both writing assessments were graded using the same rubric. The areas I graded in the students' papers were the introduction, creativity, solutions/resolution, characters, setting, and writing process. These scores were then compared to help with recommendations and conclusions. The rubric helped me score the basic components of story-writing. The students were given one writing assessment on the first day of the week, without any previous instruction about photographs. The post-writing assessment was given on the last day to gauge student writing ability and to find if my instruction helped enhance their story-writing ability. Two post writing samples are included in Appendix B.

Results

As mentioned above, my students' writings were graded using a rubric. The two writing samples, pre-and post-writing assessments, were compared in score. The following graph shows the outcome of grading from both writing assessments (Figure 1).

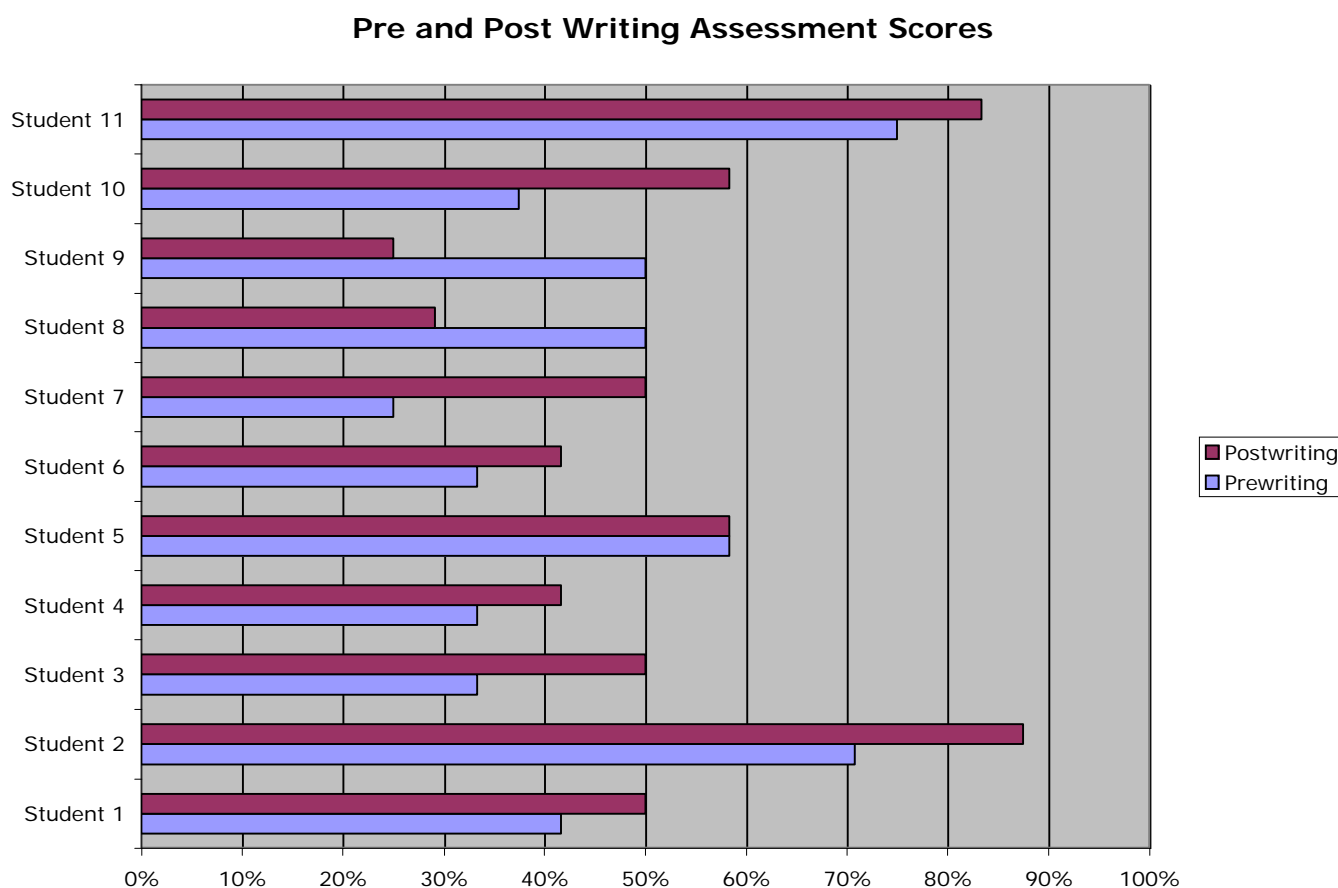


Figure 1. Pre-and post-writing assessment scores.

The graph shows that 8 of the 11 students were able to improve their writing, 3 students received lower grades on their post-writing assessment, and 1 student scored the same on both writing assessments. The highest score on the pre-writing assessment was 75%, while the lowest score was 25%. This assessment had a mode of 33%, a median of 42%, and a mean of 46%. The highest score on the post-writing assessment was 88% and the

lowest was 25%. This assessment had a mode of 50%, a median of 50%, and a mean of 52%.

The following writing standards, student performance indicators, and teacher performance indicators, as developed by the Tennessee Department of Education, were met (listed numerically in Figure 2). A narrative list of these standards is found in Appendix A.

Writing		Fourth Grade
Expt.	Learning	2.01, 2.03, 2.04, 2.09
	SPI	4.2.spi.1, 4.2.spi.3, 4.2.spi.6, 4.2.spi.7, 4.2.spi.9
	TPI	4.2.tpi.1, 4.2.tpi.2, 4.2.tpi.3, 4.2.tpi.4, 4.2.tpi.8, 4.2.tpi.14, 4.2.tpi.20

Figure 2. Fourth grade writing standards in Tennessee.

Conclusions and Recommendations

Conclusions

Due to the time given to me by my cooperating teacher, I was not able to evaluate my students' writings successfully. The scores reported in the results of this study, in my opinion, are inconclusive. I began this research knowing that it needed at least 3 weeks to implement a good lesson unit that would show results of good writing with my students. The time frame given to execute this research project only made a small impact on very few students.

This unit would also be best implemented in a year-long writing curriculum in an upper elementary grade level. This can be done with weekly writing assignments throughout the year. Dr. Kay Cowan teaches the six strands of literacy in her literacy

courses at The University of Tennessee at Chattanooga. These include hearing, speaking, reading, writing, viewing, and visually representing. Educators often do not include the last two in their literacy curriculum, but a good educator implements each strand of literacy through high school.

Many educators are using more arts integration in their literacy programs and there are many art foundations that fund these programs for public schools. These foundations fund materials, workshops, and professionals who visit the schools to work with student literacy instruction using art.

Technology plays a big part in this writing unit. Digital cameras and the use of the Internet to find quality photographs are just two avenues to using photographs in writing instruction. The accessibility of digital photography also makes it more cost effective for schools to successfully implement this instruction in their schools.

I developed lesson plans that would be useful in the classroom for writing instruction. I have focused on the basics of “reading” a photograph, to get the student aware of details in a photograph, which can show the importance of details in good writing. The time commitment of each of these lesson plans will change according to the grade and ability level of a classroom’s student population. The lesson plans are found in Appendix C.

I think this unit would have helped many of my students in their writing, both creatively and mechanically. However, I cannot show any conclusive evidence with 1 week of instruction.

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Appendix A

Narrative Form of Expectations, Student Performance Indicators, and Teacher

Performance Indicators

Writing: Content Standard 2.0.

The student will develop the structural and creative skills of the writing process necessary to produce written language that can be read, presented to, and interpreted by various audiences.

2.01 Engage in prewriting using a variety of strategies.

2.03 Show evidence of drafting and revision with written work.

2.04 Include editing before the completion of finished work.

2.09 Write expressively using original ideas, reflections, and observations.

4.2.spi.1. choose a topic sentence for a paragraph.

4.2.spi.3. identify the purpose for writing (i.e., to entertain, to inform, to share experiences).

4.2.spi.6. complete a graphic organizer (i.e., clustering, listing, mapping, webbing) to group ideas for writing.

4.2.spi.7. select appropriate time-order or transitional words to enhance the flow of a writing sample.

4.2.spi.9. select the best way to combine sentences to provide syntactic variety within context.

4.2.tpi.1. generate ideas for writing.

4.2.tpi.2. use prewriting strategies to organize ideas and to access prior knowledge.

4.2.tpi.3. write for a variety of purposes (e.g., to construct journal responses, answers to essay questions, and friendly and business letters).

4.2.tpi.4. write frequently in the descriptive mode.

4.2.tpi.8. write creatively and imaginatively.

4.2.tpi.14. use grade level appropriate vocabulary when writing.

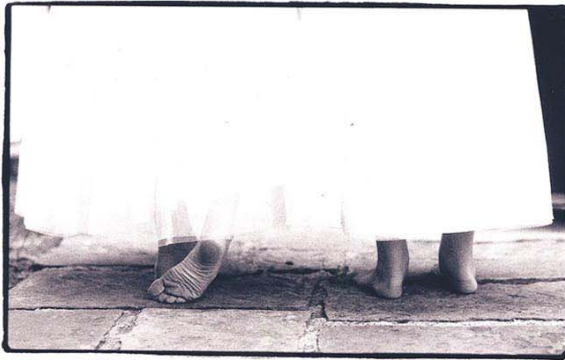
4.2.tpi.20. produce multiple drafts.

Appendix B

Student Samples from Post-Writing Assessment



One day this little boy Jamal had to get his hair cut. It was his first time. He was so scared. He begged and pleaded to his dad. But his dad said, he had to get it done. The first day he went to Benny's Barber Shop with \$15.00 but when he got off the bus he went to the candy shop. When he got home he still had his hair unshaved. As you can imagine his dad got pretty upset, angry, mad, and all kinds of frame. Those were his last \$15.00, but he had an idea. The next morning he called up his old high school buddy who just happened to own a free barber shop. Then he went with his son and got both of their heads did. But at the end of the cut his dad slipped the barber a twenty



Wedding

One rainy spring in the south part of Africa a famous wedding was going on. All the girls had on white dresses. It was famous because it was the queen getting married. Her name was Shahacy. In her marriage no one wore shoes not even men. The man she was marrying name was Jahobo. Then it started to rain and everyone was running and screaming so they had to cancel there wedding. The next year in the summer Shahacy and Jahobo got married on a day were it didnt rain. It was the best wedding ever. There were pink & white flowers, a horse carrier, one hundred people, dancers and drummers, a huge wedding cake, and lots of fruit, vegetables and regular food. The bride wore a big white wedding dress with a 3 feet veil. The groom wore a white hand made tuskito but no shoes. The girls and other women wore white dresses and the boys and other men wore black tuskitoes. When the wedding was over Mrs & Mr. Lacey got in the carriage and went to go live in there huge and beautiful palace.

Appendix C

Lesson Plans

Reading Photographs Lesson Plan:

This lesson involves showing photographs to students and teaching them to read photographs. I will use newspapers (wealth of different scenes in photos including sports, news, community life) which can be found on the Web site of newspapers from various cities.

I will begin by teaching the children how to “read” a photograph. Every photograph has a focus area, meaning that there is a main subject that jumps out to the viewer immediately. Children learning how to read a photograph need to also be aware of the small details in a photograph. These details are what support the main subject of the character and help tell the story.

The class will respond to the picture as they find all the little details in the photograph that can help them understand more of what is really going on. Sometimes there are few details. The students will write down these details as I write them on the board. I will use this time to talk about details in a story, modeling this by telling a story about my morning, but keeping it very brief:

“I woke up this morning, brushed my teeth, and drove to work.”

This short sentence can be used to elicit response of details that could be added to the story of my morning that will help readers really “understand” what happened that morning. The students can then draw a picture of something from their day and add any details they think would be important.

Taking a “Snapshot” of Their Day:

With prior knowledge from the reading photos lessons, I will have the students talk about their day and how they can capture a snapshot from their day through art. With this, I can use a visualization exercise that was taught to me by Dr. Kay Cowan. We will take 5 minutes for students to close their eyes. I will begin by asking them to “see” their room and look at their bedroom door and for them to think about which way the door opens (in or out). I will have them enter the room (in their minds) and ask them to think about and see their room. I will continue to ask them to raise their hand if they can see this, so I can tell if they are seeing what they need to see before I move the class forward.

After this visualization exercise, I will have them talk about their day and draw a picture from one of the days of the current week. They will pick one “snapshot” of the day that is important to the story of that event. This photo will be used as we talk about how to write the story of that event. I will remind them that details make the difference in this story and in their picture. Details help tell “their” story effectively so a stranger can better understand what they are talking about. They are the photographer, or artist, and have complete control over their picture.

Using a Photograph to Expand Their Vocabulary:

The next lesson we will build onto the previous lesson, which taught them how to read a photograph. This lesson allows me to discuss imagery in a photograph. What does the picture say to the viewer? What emotion is the photographer, or author, trying to convey to the viewer?

I will select a new picture from my collection of photographs. It will need to be a photograph that conveys a strong emotion, such as happiness, loneliness, sadness, etc. It should be apparent what the picture is saying. If I, as the teacher, immediately receive an

emotion from the photograph, then that photograph would be a good one to discuss with the children.

I will let the students examine the photograph, independently, telling them to take a few minutes to “read” the photograph and ask them how they feel about the subject.

Does this picture make you feel a certain way? Sad, happy, or any other emotion?

I will ask the students to respond to the photograph and write their responses on the board. While restating the list of words on the board, we will discuss other words that may mean the same as the listed words. This may get new responses from the children. I will give a pocket thesaurus to each student and ask the students to look up the word they suggested. This will present them with synonyms, new words, for their emotion words. These words are from each student’s experiences. It is important for them to know that their initial descriptive word has not changed, but has been broadened through synonyms or antonyms. This opens up the discussion about the importance of good word usage in writing stories (Cowan, 2006).

Using these new words will help in discussing the use of different descriptors in their stories to keep the reader interested. I will have the students write about the photograph using their dictionaries and thesauruses.

A Freeze Frame of Life:

A photograph is a “freeze frame of time.” Sometimes we have no idea what happened before or after the photo was taken. This is an opportunity for the students to depict, through visually representing, what the scene looked like after, or what the subject in the photograph did before or after.

I will select a photograph that I, as the teacher, can predict with an educated guess, what may have happened before or after the actual picture in the frame. This will help me guide my students in their responses. When presenting the picture, I can reinforce the reading portion from the last lesson, making sure the students still understand how to read a photograph. I will ask the students to guess what may have happened before or after the photographer snapped the shutter. These predictions can be written on the board as they talk.

The students should understand that there is not necessarily a wrong answer as they infer the situations from the photograph. The predictions could be what happened to the subject the next week, or possibly what happened to the subject leading up to this picture. It could also be the next frame of the film. What happened immediately following this scene or immediately prior to the scene?

I will ask the students to draw a picture depicting another scene, using the subject and what they felt they knew about the subject before or after this scene. This can lead to a writing lesson on the subject, using their drawing as a reference for the story.

Looking at Themselves in Pictures (a digital camera is needed for this lesson):

This project is intended to help children describe themselves, first through words, then into pictures, then back to written text.

“What is your favorite part of your body?” This question allows children to talk about what they like about themselves most, and allows them to use their own words to describe what part they like most. We will have time for each student to talk about their favorite part. I will then have each student write a short paragraph about this subject. I

will photograph each student, emphasizing the physical attribute they chose. These photographs will be used to rewrite their piece.

On the second day, we will discuss composition in photographs. Why do photographers place certain features in the foreground? If you place your feet in the foreground, what will it look like? If you take a picture from the ground looking up, will it make you look bigger than life? This will help the children see how to place things in the frame to tell their story in one photograph.

The students will be allowed to “set up” the frame for their second picture. This will include allowing them full control over how the photo will be taken and what will show up in the frame and where. I may need to guide them some in this, but I want them to think about why they organized the content the way they did. I will snap the picture so they do not have to handle the camera. These photos will be used to help the students write a short autobiography.

Selecting a Photograph

During this lesson, each student works alone with a picture that he or she chooses. As I mentioned above, the students will have a variety of photographs from which to choose. The photographs I use will depend on the students I am teaching. The students will then be able to choose one that brings in their personal experience. This process will help the children develop their writing skills, as well as their creativity, by offering another avenue to literacy (Cairney, 1997).

Should I *Really* not Smile until Thanksgiving?

Discovering the Key to Effective Classroom Management

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Education 590, Spring 2007

The University of Tennessee at Chattanooga

The Institutional Review Board of The University of Tennessee at Chattanooga (FWA00004149) has approved this research project 07-033.

Introduction to the Problem

“Don’t smile until Thanksgiving,” is the advice that several of my well-meaning friends have given me as I prepare to begin teaching. I smile in response to such counsel, but I doubt it is really the key to successfully managing a classroom, however much I wish it was.

As a pre-service teacher about to officially enter the teaching profession, I am very interested in what the most effective classroom management techniques are. Fortunately, in the world of education, there exists a plethora of research, commentary, and opinion on this very topic. In fact, the amount of different suggestions, tips, and advice is almost overwhelming. I imagine that I could start reading now and still be reading about classroom management techniques at the end of the school year, and probably beyond that. But I definitely do not want to waste a whole school year trying to figure out how to best manage my classroom. Thus, I have challenged myself with a quest – a quest to discover a magic formula for classroom management. It is possible that I am crazy and such a challenge is impossible to accomplish. However, I truly believe that both the existing professional literature and my teacher colleagues already hold the key to unlocking the mystery behind successfully managing a classroom and becoming an effective teacher.

Review of Literature

Some of the most prominent education professionals view classroom management as the most crucial element in effective teaching. For example, in their book, *The First Days of School*, Harry and Rosemary Wong (2001) state that classroom management skills are the most important abilities a teacher should have. They distinguish between

two types of teachers: (a) those who manage their classrooms well are effective and (b) those who are not good managers are ineffective and will be forced to discipline much more. They go on to say that if a class is well-managed, then students will feel secure and will then be free to focus on learning objectives. Martin Haberman (1995) in his book, *Star Teachers of Children in Poverty*, states:

Whatever the reasons for children's behavior – whether poverty, personality, a handicapping condition, a dysfunctional home, or an abusive environment – classroom teachers are responsible for managing children, seeing that they work together in a confined space for long periods, and ensuring that they learn. (p. 22)

To Harry and Rosemary Wong, the concept of classroom management is quite basic. It is “all of the things that a teacher does to organize students, space, time, and materials so that instruction in content and student learning can take place” (2001, p. 84). It is a simple definition but it has major implications for education. Without a well-ordered, smoothly-running class, it is very difficult for learning to take place. In fact, in a study that synthesized over 11,000 research findings on factors affecting student learning, the researchers found that there are 28 common factors that affect student learning, and classroom management was the number one factor (Wang, Haertel, & Walberg, 1993-94). In other words, “without an appropriate classroom atmosphere, learning cannot occur...” (Conro, 2006, p. 1).

Five Rules for the Classroom Manager

With that being stated, then the next logical step for a teacher is to discover what the magic formula is to managing a classroom well. According to the literature, being an

effective classroom manager involves five basic rules: be in control, be clear, be consistent, be persistent, and be organized.

Be in Control

From the very first day of school, the teacher must be in control of the class (Conro, 2006). This is important because what happens during the first several days of school sets the stage for the rest of the school year (Wong & Wong, 2001). Teachers can exhibit control over the class by being serious when they present class rules and procedures (Conro, 2006), by assertively enforcing class rules in a quick manner (Brown, 2004), by not allowing bullying, teasing, and sexual harassment to happen (Pohan, 2003), and, perhaps, most importantly, by rehearsing procedures over and over until the students do not need any teacher prompting (Marshall, 2005; Wong & Wong, 2001).

Be Clear

Another important aspect in classroom management is to always be clear with students. It is important to give students clear rules, procedures, consequences, learning objectives, expectations, and assignments (Conro, 2006). The clearer the teacher is, the less confusion there will be about what students are responsible to do or not do. Classroom rules should be explained at the beginning of the school year or semester, and should be clearly displayed in the classroom. However, teachers will likely still have to remind students of the rules on a continual basis. Classroom procedures should also be explained in the beginning, and it is advisable that teachers type out the procedures and have students keep it in his or her notebook. Teachers should also give students clear learning objectives because it allows students to take ownership in learning the material (Johnson, Rice, Edgington, & Williams, 2005; Wong & Wong, 2001).

Be Consistent

Teachers must strive to be consistent in as many areas as they are able. This includes consistency in rules, procedures, enforcing rules, being fair, showing respect, etc. Consistency is important because, when students know what to expect in your class, and are not taken off guard by constant changes, they will be more confident and stable. Students need and prefer consistency (Conro, 2006).

Be Persistent

Persistence is an important quality for teachers to have because, often times, it takes several attempts to get through to a particularly tough student. In a survey given to African American and Hispanic American students in urban schools, the students stated that “they knew teachers cared when they pressured students in an assertive manner to complete assignments, pay attention, and perform better academically” (Brown, 2004, p. 272). Brown encourages teachers to give tough love to students, and not let them slide and get away with not doing work. Furthermore, if students see that a teacher really wants to see them do well, they will likely be more motivated to do their best.

Be Organized

Being organized is a crucial factor in having a well-managed classroom. First of all, teachers need to have organized procedures. For example, teachers should have a structured system for incoming paperwork such as homework, papers from home, permission slips, school correspondence, papers to grade, etc. One suggestion given in the literature is to hang a row of “in-boxes” on the wall or place them on a table near the teacher’s desk to deal with all the paperwork (Johnson, Rice, Edgington, & Williams, 2005). Teachers can also remain organized by having a set procedure for absent students.

It is advisable to have a designated place in the classroom where students can pick up a packet of information or work they missed, and what they must do to make up the class they missed (Johnson, Rice, Edgington, & Williams, 2005).

Another important aspect of being organized is having air-tight lesson plans that “maximize time on-task” (Conro, 2006, p. 4). Teachers need to plan effective lessons where the students are working and have limited off-task time. This will decrease the likelihood of student misbehavior (Johnson, Rice, Edgington, & Williams, 2005). A definite benefit of limiting off-task time is that students are spending more time working, and, according to Harry and Rosemary Wong, “The person who does the work is the one who learns” (2001, p. 204). The Wongs suggest the following to increase on-task learning time:

1. Have an assignment posted daily to be done upon entering the classroom.
2. Teach procedures and routines to maximize interruptions and maximize uninterrupted learning time.
3. Constantly monitor students so as to keep them on task. (p. 206)

Enhancing Classroom Management

According to the literature, being an effective classroom manager is much more than having a set procedure for turning in homework or for using the hall pass. From all the educational research that has been done in schools, and also from personal experiences of different teachers, there has emerged a myriad of factors that, if present, have proven to positively affect the atmosphere of a classroom, enhance teachers’ management efforts, and reduce misbehaviors. The factors can be categorized as the following: be relational, be respectful, be fun and engaging, and be positive.

Be Relational

M. B. Flippen, the creator of the Capturing Kids' Hearts program for educators, says that, "If you have a child's heart, you have his head" (2007, p. 1). This can only happen by first being relational, which simply means that teachers take a genuine interest in each individual student and seek to learn about his or her interests, learning strengths, learning weaknesses, likes, and dislikes. Furthermore, it also means that teachers seek to influence and develop the total person. In other words, teachers "must be committed not only to academic achievement (i.e., cognitive development), but also to the social, emotional, moral/ethical, and psychological development of each and every student" (Pohan, 2003, p. 370).

The concept of being relational in the classroom was summed up well by a high school English teacher in Wichita, Kansas. He said, "[Teachers are] there to teach kids, not subjects" (Brown, 2004, p. 279). It is sometimes easy to forget that the teaching profession is more than just a job or teaching a content area, but it involves teaching human beings with real feelings. It is disheartening to see some teachers forego the privilege of having relationships with their students. Even in urban schools that notoriously have the toughest kids, students want relational teachers. According to Brown (2004), "Most significant...to each child or adolescent in urban schools is the willingness and ability of an educator to genuinely touch each student's social and emotional persona" (p. 269). He says that the best urban teachers create "caring learning communities and [demonstrate] genuine interest in each student" (p. 286). Being relational can have a very positive effect on classroom management because when students know you care, they will often go out of their way to obey and help you.

Be Respectful

In the estimation of some, the concept of teachers showing respect to students is a given. However, it is apparent that this is not happening in every classroom. In fact, it is probably safe to say that, during every school day in our country, countless teachers are disrespecting students (and vice-versa!). Some examples of such disrespect are issuing ultimatums, demeaning or humiliating students, sending students to the office for minor infractions, and yelling or screaming at students (Conro, 2006).

Being respectful to each and every student is a must for teachers. In a 2004 study, involving a small group of urban teachers, Brown found that the most effective teachers “demonstrated mutual respect for students through congruent communication patterns that honored students’ ethnic and cultural needs” (p. 286). Teachers can give respect to students by being fair (Conro, 2006), by helping students to be self-disciplined (Bucher & Manning, 2001), by teaching students they are ultimately responsible for their own behavior (Johnson, Rice, Edgington, & Williams, 2005), by involving students democratically in creating classroom rules and procedures, and by promoting a caring classroom where the class is a family and students feel they belong there (Pohan, 2003). Another powerful way to show respect to students is to give them options in assignments and in punishments. “Choice empowers. Since people do not argue with their own choices, this approach engenders ownership...while, simultaneously, reduces resistance. Many behavior problems erupt when the student perceives, especially in front of peers, that no option is available” (Marshall, 2005, p. 51-52).

Be Fun and Engaging

Involving fun and engaging activities in classroom instruction is definitely something that teachers should do often. In fact, psychiatrist William Glasser believes that one of the four basic psychological needs that drive students is the “need for fun” (Bucher & Manning, 2001, p. 88). He believes that if the need for fun is met, then students are much less likely to misbehave. Pohan (2003) also claims that an “engaging curriculum” will help prevent misbehavior. Although it is definitely important to be serious, teachers will do well to add fun and engaging activities to their repertoire of instructional methods.

Be Positive

As a teacher, having a positive attitude is an important aspect of classroom management because it sets the tone for the entire class. Marshall explained the concept of being positive in a clear way:

People do better when they feel better, and that which people perceive affects the way they feel. For example, if you receive a compliment, then a positive feeling emerges. On the other hand, if you are criticized, a negative feeling erupts.

Effective teachers communicate in a way that promotes what is desired, rather than what is not desired...The first practice to promote appropriate behavior is to be proactive by presenting expectations that are positive. (2005, p. 51)

Research Questions

1. What are the most effective ways to manage a classroom?
2. What do veteran teachers (and teachers of all levels) believe is the most efficient way to manage the classroom?

3. What types of classroom management skills do administrators believe to be the most successful?
4. What types of classroom management skills do students respond to the best?

Data Collection and Results

On my quest to discovering the secret formula to effectively manage a classroom, data was collected from a myriad of sources.

Interview with Veteran Teacher

A set of data came from an interview with my own father and mentor, (personal communication, January 12, 2007), a veteran History, Bible, and Math teacher of 9 years. During the interview, the first thing my father said was, “Lesson plans are the key.” He went on to explain that if the teacher is well-prepared and has a solid game plan for each class that is engaging and leaves little off-task time, then student misbehaviors will be greatly reduced. The second piece of advice he gave was to be a good communicator. He said it is vital to communicate clear expectations to the students so that they have no question what you require of them; unclear expectations can result in frustration, and, sometimes, it gives students leeway to argue with you. Furthermore, he added how important it is to communicate with parents. He believes that one of parents’ biggest complaints about teachers is that they do not return parent phone calls. The third piece of advice my father gave me was to be in control. He explained that, back at the beginning of public education in the United States, teachers were considered to take the place of parents while the children were in school. Thus, when the students were in school, the teacher had absolute authority and the kids knew it. Now, even though that type of teaching situation is all but extinct in our country, my father suggested that teachers will

do well to be confident and assert control in the class, as if they *were* the absolute authority. He added that communicating often with parents is very helpful in establishing control. Finally, my father proffered that an effective teacher is genuine. He believes that being authentic and sincere goes a long way in building relationships with students, no matter how old the student is, and in his experience, students can “smell a phony” from a mile away.

Questionnaires at Suburban High School

Another set of data is from anonymous surveys given to teachers and administrators at a suburban high school in Chattanooga, TN. Approximately 83 teacher surveys (see Appendix A) were dispersed, one per teacher, and 6 administrator surveys (see Appendix B), one per administrator. Exactly 15 teacher surveys and 2 administrator surveys were returned. The data were combined due to the similarity in questions.

In this survey, teachers and administrators were asked several open-ended questions and allowed to answer as they deemed best. The results are displayed in Figure 1 and Figure 2. With this kind of research instrument, one is never sure if there will be any similar patterns, at all, among the responses. However, there definitely were. For example, from the question, What do you believe are the most effective classroom management strategies and why?, approximately two-thirds (65%) of the respondents implied there are specific teaching strategies that are very effective in keeping the classroom maintained. The most frequently mentioned strategy was using a warm-up exercise, or “bellringer,” at the beginning of class. A science teacher of 9 years explained the reasoning for a warm-up: “[It] gets the students into a learning frame of mind immediately and gives me time to call roll, check homework, etc.” A history teacher of 8

years said, “The worst thing you can do is to not begin class when the bell rings! Work from bell to bell.” Some other effective teaching strategies mentioned were using visuals, cooperative learning, using hands-on activities, independent projects, and using personalized instruction.

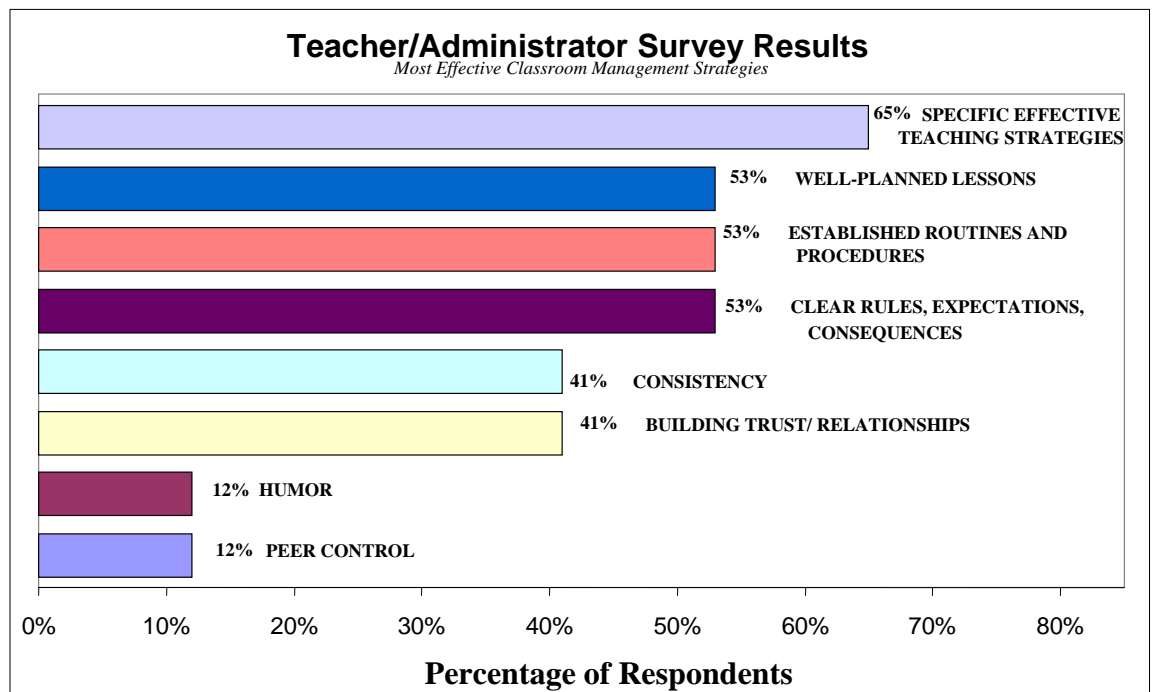


Figure 1. Most effective classroom management strategies.

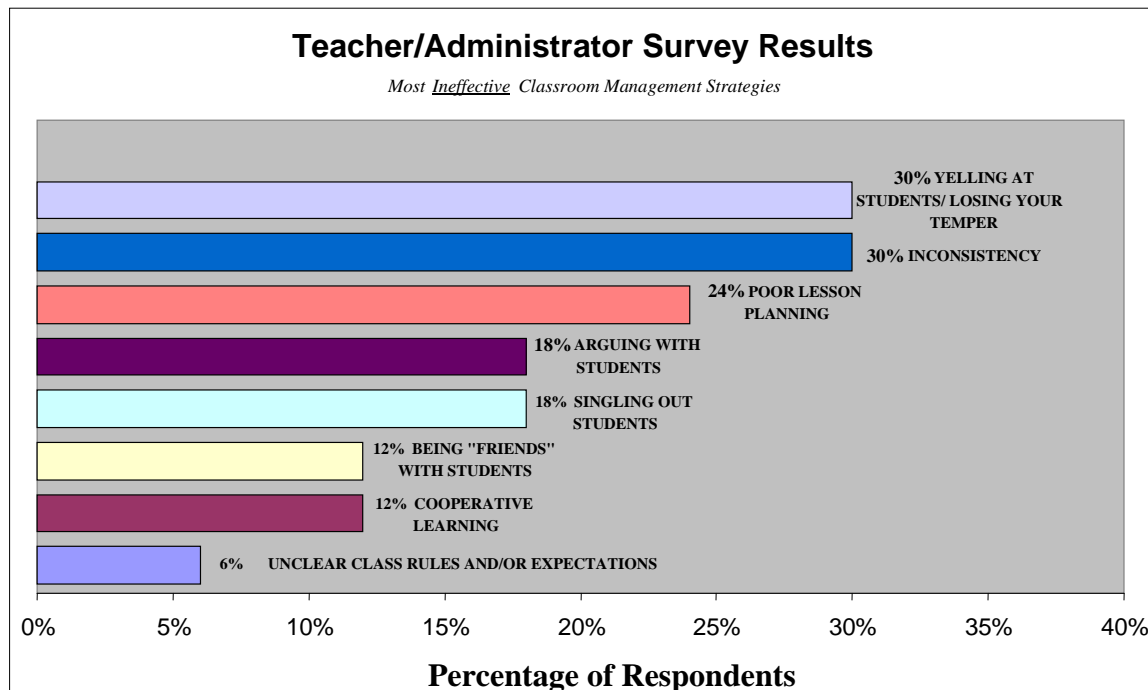


Figure 2. Most ineffective classroom management strategies.

Over half of all the respondents mentioned the idea that well-planned lessons have been an effective classroom management tool. A first year math teacher said, “Keeping the students engaged in the content...reduces management problems.” The same percentage of respondents, 53%, also mentioned that established routines and procedures and clear rules, expectations, and consequences are very effective in managing the classroom. A marketing/advertising teacher of 10 years said, “I expect from day one for my students to act a certain way. If you have high expectations you get the results you want.” An information technology teacher of 10 years said, “Follow and enforce school rules for everyone...the rule is your ‘back-up’ or ‘excuse’ and you can’t be accused of showing favorites.” One teacher suggested allowing students to set their own rules, within reason. Several respondents suggested that it is important to clearly explain the

procedures and rules. A few mentioned placing a list of rules in the students' hands. One of the administrators, who was formerly a language arts teacher for 18 years said, "Procedures and routines need to be well established and referred to throughout the first month or so of school." The administrator also recommended having no more than five classroom rules.

A good number of respondents, 41%, mentioned consistency as being a crucial element in maintaining the classroom. An English teacher of 13 years said, "Probably the one most effective [strategy] is the one 'owned.' Two teachers can use the same technique but will end differently if not suited to that particular one...but whatever the style, I think consistency is the key." A Spanish & English teacher of 34 years proffered, "Having clear class rules and sticking to them makes class time more meaningful and helpful to everyone."

Forty-one percent of the respondents also mentioned relationships and/or building trust as being an effective classroom management tool. An information technology teacher of 12 years said, "Build trust. If a child doesn't believe that you genuinely care, he or she will not be motivated to cooperate with you." A veteran teacher of 34 years said, "Students need to feel that they are important and that the teacher cares." Another teacher suggested that teachers should "relate to students in as an adult manner as possible."

A few respondents mentioned humor as an effective management strategy as long as it is appropriate and timely. A few other teachers mentioned "peer control" or "peer pressure" as effective strategies. One teacher recommended "[relating] to the leaders [because] they will set examples and admonish the problem makers."

On the flip side of effective classroom management techniques are the many ineffective strategies that teachers sometimes resort to in desperation, or because of a lack of understanding of what negatively affects students. The most frequently mentioned ineffective management strategies were yelling/losing your temper, inconsistency, poor lesson planning, arguing with students, singling-out students, being friends with students, cooperative learning activities, and unclear classroom rules and/or expectations.

On the subject of yelling, one teacher suggested “fussing in a slow, calm voice” and rarely yelling so that in the rare case that you must raise your voice, students, she says, “will take you much more seriously.” Another teacher commented in length about why teachers should not strive to be “friends” with the students. The teacher said, “Students need and want limits and rules, although they don't realize it. Students will respect you more for being a role model. [They] want a learning environment.” Several teachers mentioned the danger in confronting/singling out students in front of their peers. The general consensus from the surveys is that it causes students to rebel instead of complying with your requests.

Observations of My Teaching

The third set of data is from observations of different classroom management techniques I used in the classroom while student teaching. While student teaching at the suburban high school, I not only faced the challenge of looking very similar in age to the student population, but also of dealing with students who wanted to be treated as adults, yet still often acted like children. My strategy in managing said students, therefore, was to clearly communicate my expectations, treat each student with respect, to not publicly humiliate or confront anyone, and to assert myself as the leader, instead of their peer. As

a result, I dealt with very few behavior problems. Upon observing my strategies, a fellow Spanish teacher of 10 years said, “In a short time Jessica has developed a student/teacher relationship. She has earned their respect.... [She] positively recognizes all students...has high expectations for herself and the students.”

Conclusions and Recommendations

Conclusions

Throughout my research, my key question has evolved. Over time, I found that I was really seeking the answer to this question: What strategies keep the classroom under control best to provide the optimum learning environment for students? Throughout my quest to answer this question, I had a lot of input along the way. Looking back, I see that every day I spent teaching in the classroom was really spent trying out the different strategies and methods I was learning. Some of the classroom management strategies were effective; some were not. Some made my life as a student teacher significantly easier; some strategies made me miserable! Overall, however, I feel that I have now emerged with a simplified classroom management philosophy. To me, the three most important elements are building relationships, having clear procedures, expectations and rules, and preparing a fun and engaging curriculum.

I definitely believe that building relationships with students is the most important element in successful classroom management. I found that genuinely caring about the students' feelings, interests, and preferences made all the difference when it came time to getting the class under control and on-task. I honestly believe that relationships with students is the foundation for building a successful learning environment.

A not so distant second key element in successful classroom management is having clearly established procedures, expectations, rules, and consequences. If procedures are present, then little time is wasted during a class period. If expectations are clear, students will feel more secure in your class and will not accuse you of playing favorites or being unfair. Rules and consequences need to be clearly stated, explained to students, and displayed in a location where students can review them often and hopefully commit them to memory. Rules and consequences are necessary to maintain an orderly learning environment and provide healthy boundaries for students.

The final element in successful classroom management is providing a fun and engaging curriculum. School is often referred to as “boring,” but it does not have to be that way! There are countless ways that teachers can include some fun activities into his or her curriculum to keep students from “checking out” and losing interest in the subject matter. I believe that every topic can be made interesting, but it usually will require a little extra work on the part of the teacher.

In summary, teachers will do well to put relationships with students first, maintain clear procedures and rules second, and to put the extra effort into lesson planning in order to most effectively engage the students in learning.

Recommendations

The American Council on Teachers of Foreign Languages (ACTFL) believes that involving foreign language students with effective teaching strategies is vital. Thus, it does not offer specific professional development on classroom management but it does provide extensive opportunities for learning valuable foreign language teaching strategies. More information is available at <http://www.actfl.org/>.

It is my recommendation that all teachers should attend a valuable professional development course entitled, Capturing Kids' Hearts (<http://www.flippengroup.com/>). The basic premise of the course is to teach teachers how to build meaningful and secure relationships with students in order to have the greatest impact on teaching academics. There are grants available for teachers who may be interested in attending this professional development course and others that are similar. One such grant is offered by the National Education Association (NEA) Foundation. It offers \$2,000 for individuals and \$5,000 for groups. The funds can be utilized for fees, travel expenses, and materials. See <http://www.neafoundation.org/> for more information.

Technology has the potential to play an important role in effective classroom management. In this day of media driven students, it will grow more and more important to incorporate technology into instruction in order to maintain student interest, thereby discouraging off-task misbehaviors. Foundations such as the Milken Family Foundation are a good source for further information about how to incorporate technology into the classroom. Visit their Web site at <http://www.mff.org/edtech/>.

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Appendix A

Classroom Management Questionnaire for Teachers

1. How long have you been in the teaching profession?
2. How long have you been at [this high school]?
3. What content area(s)/specialty(-ies) do you teach?
4. What do you believe are the most effective classroom management strategies and why?
5. What do you believe are the most ineffective classroom management strategies and why?
6. What types of classroom management strategies do students respond to the best and appreciate the most?
(List below or put an asterisk* by the strategy above)

Appendix B

Classroom Management Questionnaire for Administrators

1. How long have you been a school administrator?
2. If applicable, how long have you been in the teaching profession?
3. If applicable, what content area(s)/specialty(-ies) do you (or did you) teach?
4. How long have you been at [this high school]?
5. What do you believe are the most effective classroom management strategies and why?
6. What do you believe are the most ineffective classroom management strategies and why?
7. What types of classroom management strategies do you believe students respond to the best and appreciate the most?
(List below or put an asterisk* by the strategy above)

Using Computers in the Classroom to Enhance Students' Acquisition of Knowledge

Eric N. Roberts

Education 590, Spring 2007

The University of Tennessee at Chattanooga

*The Institutional Review Board of The University of Tennessee at Chattanooga
(FWA00004149) has approved this research project 06-211.*

Introduction to the Study

Computer usage, and its effectiveness in the classroom, has been researched studied, and is growing in popularity. A variety of organizations and educational institutions have given their opinions on this topic. The findings have shown an increase in retention and understanding, independence, and higher test scores. A study will be conducted with seventh-grade students in a suburban middle school. Tests, along with a lesson plan, are to be utilized to collect the necessary data in order to find out whether or not computers are actually effective in the enhancement of learning. Students with access to computers will be able to exhibit greater learning through higher post-test scores.

Review of Literature

Computer use inside the classroom has greatly increased over the last 15 years. Students are experiencing computer-assisted instruction (CAI) for methods such as computer simulations in a variety of science exploratory activities (Business Wire, 2004; Eichler, Xavier, Araujo, Forte, & Del Pino, 2005; House, 2002; Leonard, Davis, & Sidler, 2005; Rother, 2004). Additional uses of computers include role-playing (Eichler et al., 2005) and research projects (Chun-Yen, 2002; Patton, 2004; Pedersen, 2003).

Business Wire (2004) and Leonard et al. (2005) have stated that CAI has been used as an effective learning tool in the classroom. There are researchers, however, who have noted conflicting views on the efficiency of CAI (Chun-Yen, 2002; Ohmann, 2002). Two examples of this inefficiency of CAI include mishaps observed in its use (Eichler et al., 2005), as well as no noticeable increase in science learning with computers (House, 2002).

When students use computers, they receive assistance to increase their levels of motivation to work independently at projects. Numerous authors have included this topic of intrinsic motivation in their articles on CAI (Chun-Yen, 2002; House, 2002; Leonard et al., 2005; Patton, 2004; Pedersen, 2003; Shields & Behrman, 2000). In their articles, Patton (2004) and Pedersen (2003) discuss the increase in independence and responsibility among students who use computers.

Along with an increase in responsibility and independence, students who use computers also have enhanced problem-solving skills (Eichler et al., 2005; House, 2002; Leonard et al., 2005; Patton, 2004; Pedersen, 2003; Rother, 2004). This problem-solving skill with computers encourages students to collaborate with their peers (Pedersen, 2003) and to experience an increase in interest of the subject matter (Chun-Yen, 2002; House, 2002).

There has been a significant increase in the levels of students' retention and understanding of the material they have been exposed to by way of computers (Business Wire, 2004; Chun-Yen, 2002; Eichler et al., 2005; Leonard et al., 2005; Pedersen, 2003; Rother, 2004; & Shields & Behrman, 2000). Additionally, students learning with classroom computers have obtained higher test scores (Business Wire, 2004; Chun-Yen, 2002; Pedersen, 2003; Rother, 2004).

Numerous studies have provided a backbone for the argument that computers enhance student learning (Business Wire, 2004; Chun-Yen, 2002; Leonard et al, 2005; Patton, 2004; Pedersen, 2003; Rother, 2004; Shields & Burman, 2000). Students using computers learn more efficiently, enabling them to retain and understand information better than their peers who do not use computers.

The use of computers in the classroom has increased and is becoming more popular. Numerous studies have been conducted on computer use in educational facilities. CAI may take the form of computer simulations, role-playing, problem solving, and research projects. Studies have shown that students working on computers in the classroom display an increase in their levels of independence and motivation. Additionally, students using computers learn with greater efficiency, which enables them to retain and understand information. This retention and understanding of material is displayed by higher test scores obtained by students exposed to computers. Overall, according to the research, a student's acquisition of knowledge is enhanced by the use of computers.

The goal of my M. Ed. program is to become a high school biology teacher. I have experienced the use of computers in a variety of classroom settings and have seen them used for simulations and experiments. Computer programs bring life to a topic and have the ability to present a particular problem or experiment in a variety of ways. I feel that computers would benefit my teaching, and that my students could improve their learning by using them. There is a powerful tool at our fingertips and teachers need to tap into its potential and effectiveness. This action research project will explore whether or not students will increase their acquisition of knowledge if the educator uses computers in the classroom as an instructional tool. Three research questions that will be addressed throughout the course of this study include the following:

1. Do computers enhance learning?
2. Do computers increase retention and understanding?

3. When students learn through the use of computers, will they achieve greater independence and motivation?

Data Collection and Results

Participants

In this study, the researcher intends to teach students in the seventh grade. They will be a mix of male and female students. Their ages will range from 12 to 13 years old. The students will originate from diverse ethnic backgrounds, with a variety of cultural practices. They may predominantly fall into the middle and lower class categories. The students are arranged under block scheduling, which means that the class periods are all 90 minutes in length. There were a total of four blocks taught by the researcher. The students in block one are mostly inclusion students. The students in blocks four and six are either on or below grade level. Students in block five are mostly gifted.

I will be measuring the students' learning based on their test results, and their attitudes toward using computers through observation. The independent variable is the method of computer usage in teaching the lesson on cell organelles. I have control over this variable because I can manipulate how I present the lesson and use the computer throughout my instruction. The dependent variables are the measure of student learning, based on their test results, and student attitude toward learning, based on observation.

Materials

The materials required in this study will be a laptop computer and a projection device to display the computer's image onto the wall. Additional materials include a pre-test, a post-test, and a lesson plan on the organelles of the cell.

Design and Procedure

The data for this project was collected at a suburban middle school located in southeastern Tennessee. A unit on cells was begun at the beginning of the week, and the students received instruction about cells. As the week went by, the students were engaged in activities and reading assignments that gave them informative material about the cell and its components. There was a pre-test (see appendix A) issued to the students before they had a major lesson on the organelles of the cell and the nucleus. The pre-test had a variety of styles of questions included in it, such as multiple choice, true or false, matching, and short answer. The questions on the pre-test asked about plant and animal cells, the cell theory, cell organelles, eukaryotic and prokaryotic cells, and the cell wall and cytoskeleton. It was a detailed and extensive test, covering lots of material.

The pre-test was graded and the results were analyzed by the researcher. The pre-test was not accepted or received with a lot of appreciation and excitement. This could have been due to the fact that the students were not used to the pre- and post-test form of assessment. Their teacher does not regularly use that type of assessment in the classroom. The pre-test was issued to blocks one, four, five, and six. All four blocks were included in the study, however, only blocks four, five, and six had their results recorded, due to misbehavior from the students in block one. They were chosen, along with block four, to receive instruction using computers, but this privilege was revoked due to misbehavior on the part of the students.

The pre-test results were recorded from blocks four, five, and six. The lowest score was a 60% and the highest score was a 77%. There is a buffer zone given by the cooperating teacher that prevents the students from receiving any score lower than a 60%. This can help to keep the students from failing in a particular subject. The average score

for all three blocks was 63%. The pre-test was used to collect data that could tell the researcher how much the students knew about cells before they received information from a PowerPoint presentation on the organelles of the cell.

Following the pre-test, the students from block four were taught a biological lesson on the organelles of the cell. This lesson began with an activity in which the students went to the lab and were instructed to build an organelle of their choice using clay. Then they needed to present their organelle to their classmates and describe its structure and function. The students worked on building their organelles and presented them to their classmates. This was an effective activity to introduce the students to the organelles of the cell and it, allowed the researcher to move into the next activity which used the computer and an interactive PowerPoint presentation.

The students in block four were taken through the interactive PowerPoint presentation in which they could select an organelle from the first slide. Then the researcher would click on that organelle and advance to another slide which contained detailed information about that particular organelle. There were also links attached to the titles and pictures on the slide that could be visited, and additional information about the organelle could be learned and discussed. At the end of the PowerPoint presentation, the students were able to be involved in interactive quizzes that tested their knowledge. They could make a selection by raising their hand and telling the researcher which answer they would like to choose. There was a matching game online, as well as online questions. The students in block four were thoroughly involved in the learning process about the cell organelles, and seemed to enjoy the interactive nature of the PowerPoint presentation.

Students in blocks five and six did not receive instruction using the computer. They did the lab activity and had other instruction in the classroom. Then they were issued the post-test. Block four also received the post-test following their instruction with the use of the computer. The post-test was immediately given to the students after instruction so that the material was still fresh in their minds.

The post-test (see Appendix B) was altered a bit before it was distributed to the students. I removed the essay/short answer questions, and a few multiple choice questions, along with several of the true or false questions. Overall, the test was the same with some slight modifications. The results of the post-test were higher for all three blocks. There was a significant improvement in the scores of the post-test. In block four, the block in which students had exposure to instruction with computers, student scores increased from 60% to 68%, 67% to 95%, and 73% to 95%. The post-test scores are a huge improvement over the pre-test scores, and show very clearly that the computers helped in the learning retention of the students in block four, who are on or near grade level. The average score for block four on the post-test was 71%, which was only 8% away from the average score for blocks five and six, which was 79%. Both of these averages were higher than the average for the pre-test, which was 63% for all three blocks.

After all the data was collected and recorded, it was arranged in graph format to appropriately display and present the results obtained from the research project. In Figure 1, the pre- and post-test scores of block four are shown. Some of the pre-test scores for block four are higher than the rest, and these high scores range from 63% to 73%. These higher than average scores for the pre-test could have been due to the students having

different science teachers when they were in lower grades. A difference in science teachers could have a huge impact on the way the students' learn and get themselves involved in the scientific processes of learning. Some of the students in block four may have been exposed to more scientific information than the other students that are in their same block. The teacher could have played a significant role in the retention and learning of the students, and that may have had a slight impact on the results of the pre-test.

Block 4 pre and post test scores

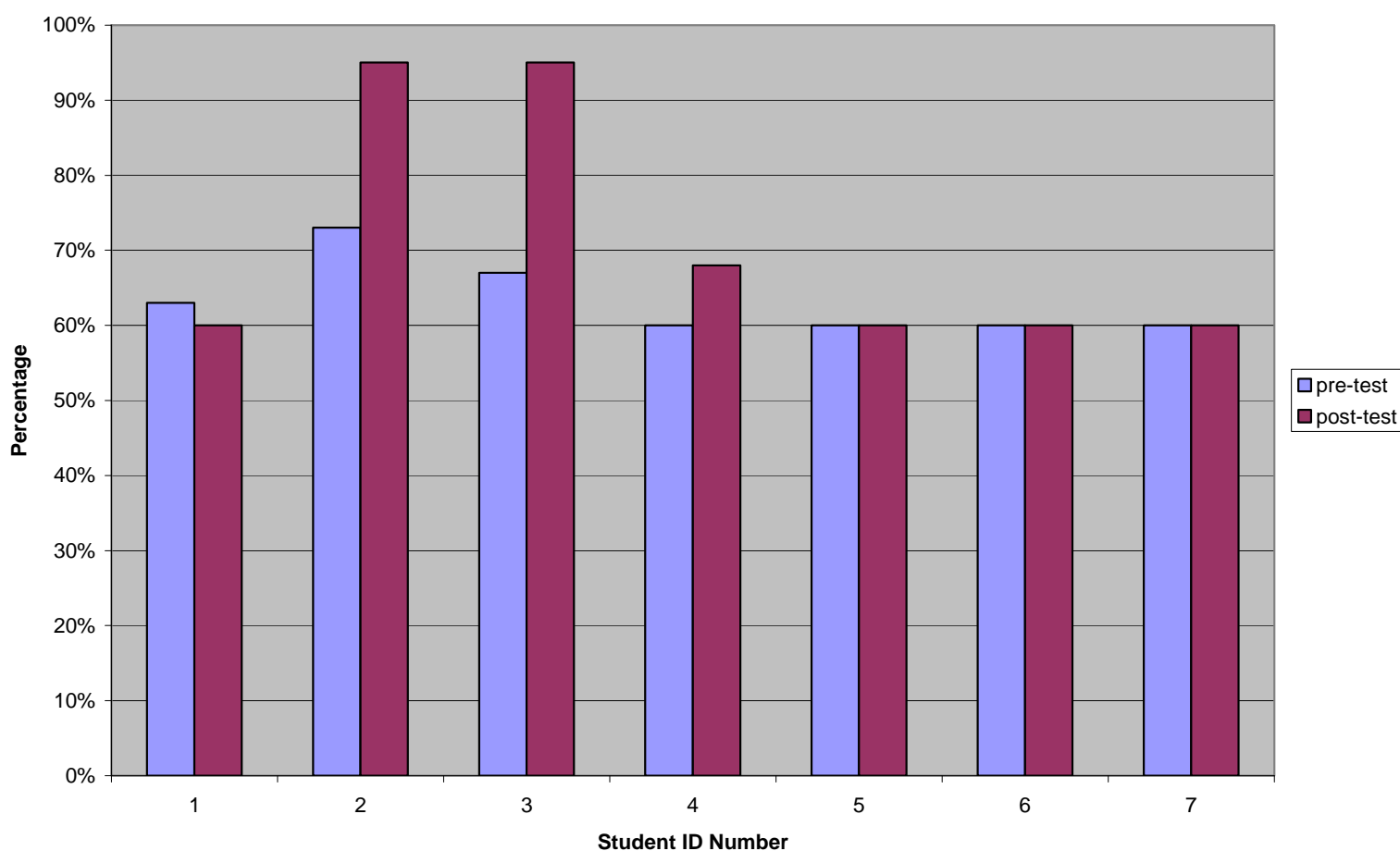


Figure 1. Block four scores for the pre- and post-test.

In Figure 1, the results of the post-test for block four are displayed to show how they compare to the results of the pre-test. The scores for block four on the post-test show some scores that are significantly higher than those scores in the pre-test. There were three scores higher than a 60% on the post-test for block four. These three scores are critical to the research project because they clearly show an increase in the level of retention and knowledge that was gained from the computerized instruction. A factor that comes into play here is sample size. There may have been more 60% scores or more percentages higher than the 60% mark, but this was the sample size with which the researcher could work.

Figure 2 is a little bit different in its results than Figure 1. Figure 2 includes the pre- and post-test scores of blocks five and six. In block six, the students are either at or slightly below grade level, but they are not above it. In block five, there are several students who are gifted. This information about some of the students in block five helps to explain why there is a distinct difference in the pre- and post-test scores between block four and blocks five and six combined. In Figure 2, there were more post-test scores that were higher than the post-test scores in Figure 1. Blocks five and six did not receive instruction with the use of computers before they took their post-test, yet their scores were higher, overall, than the scores in block four. Another factor, besides the gifted learners in block five, could have been the sample size. The sample size is larger for blocks five and six than it is for block four. Perhaps, if there had been a larger sample size for block four, there would have been higher scores, across the board.

Pre and post-test of block 5 & 6

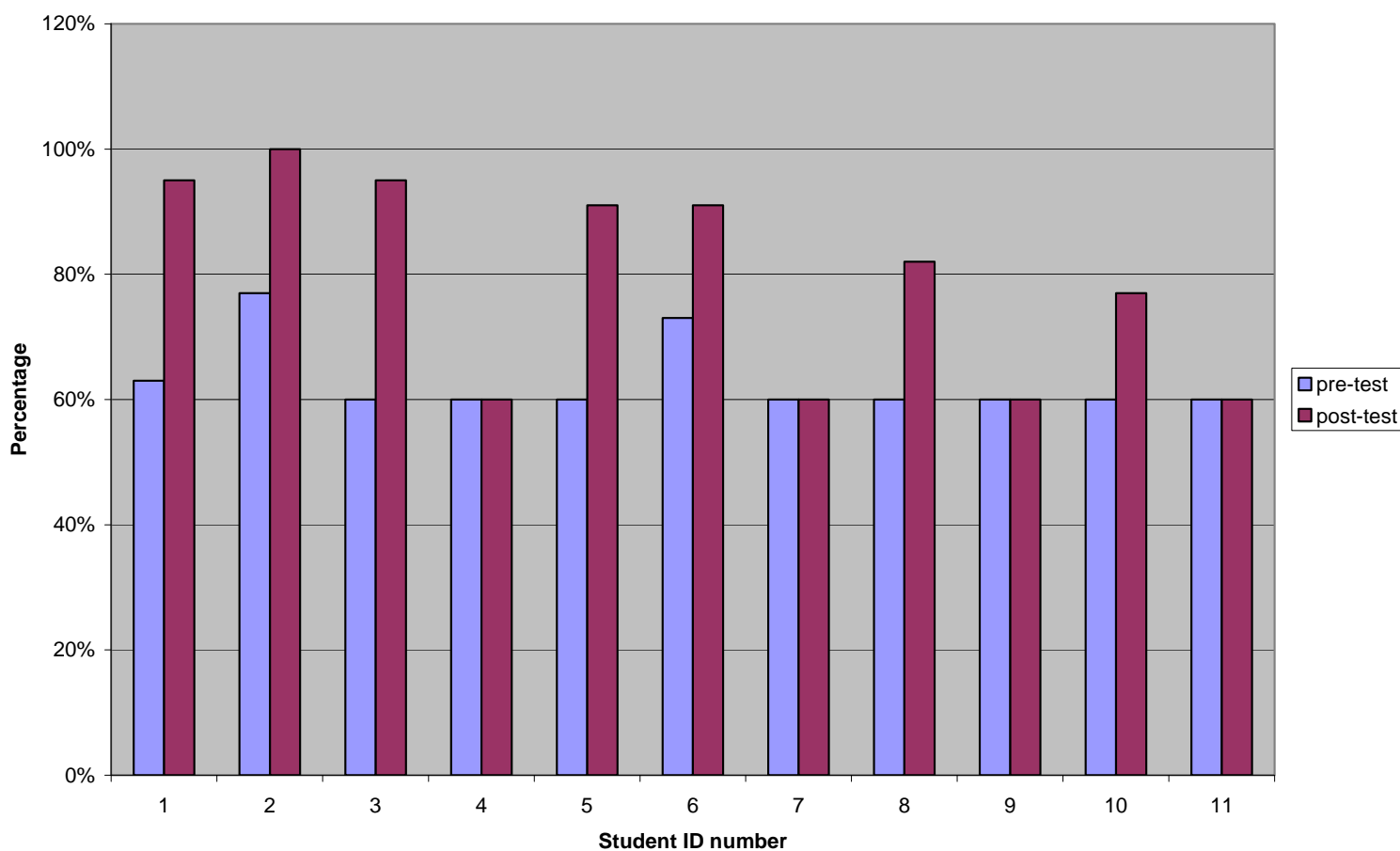


Figure 2. Block 5 and block 6 scores for the pre- and post-test.

Conclusions and Recommendations

Based upon the results of the case study, all three of the research questions that were originally asked were able to be answered. The first question asked was whether or not computers actually enhance the learning. The results displayed in Figure 1 clearly show an increase in the learning of the students because of an increase in their test scores. There was an increase in the pre- and post-test scores for students in block four, which contained the students that were exposed to the use of computers during instruction.

The second question asked was whether or not computers increase retention and understanding of the material that is being taught. This question is a tough one to measure and requires a long time for an accurate measurement, but, for the purposes of this research project, the results in Figure 1 show that the students retained the information and were able to remember it for the post-test. Not all of the students in block four retained the information, as did other students. Some of the students scored lower on the post-test than they did on the pre-test. These results could have been caused by a difference in the learning styles of the students. The students who scored low on the post-test and did not exhibit an increase in their scores, could have been distracted by the computerized instruction, and it may have been a hindrance instead of a help.

The third question asked was whether or not there is an increase in the motivation and independence of students when they learn using computers. As the researcher observed the learning of the students in block four, there was a display of ownership in some of the students and they seemed excited about learning and were actively involved.

This research project was conducted at a middle school where plans have been made and are being finalized to build a brand-new school with a variety of technology. This is an exciting endeavor for the administration, staff, and student body. The current school building is old and in need of repair. The technology is old and in need of an upgrade. With the new school, this research project holds a lot of merit due to its content and results regarding the instructional use of computers.

There are several recommendations that could be made in the area of professional development for teachers, with regard to using computers to enhance instruction. Not all of the teachers will be eager and ready to use computers in their teaching. These

particular teachers are those who have been teaching for years, are quite satisfied with their strategies, and feel that what they are doing is working, and needs not be altered. An example of a positive professional development for this type of teachers would be to develop technological workshops that have the capacity to walk teachers, hand-in-hand, through the technological set-up so that they can comfortably and easily use computers in their teaching. If teachers are given options that are easy to use and nonthreatening, then they may be more willing to switch into new or varied methods of teaching.

Another recommendation for professional development would be to make a provision for extra training on computers. The computers cannot simply be given to the teachers with an expectation that they will use them to their fullest capacity. There needs to be training provided that exposes the teachers to simple strategies that can be improved and modified, if the user so desires. Once the teachers grow in their proficiency, they should be able to move into higher-level training.

A final recommendation would be for the school to hire computer technicians or technical staff that can be available, both in and out of the classroom, to help teachers become comfortable with the technology, and learn how to most effectively use it in their classrooms. The teachers may not venture into new areas of technology, and they may not take risks, if they are in this by themselves. The presence of a trained staff person may be the catalyst to help a teacher take that risk and jump into the next level of technology.

Grant money is available for school districts to use to incorporate technology into their instruction. There are both oppositions to, and acceptances of, the funding for the intervention of computer technology. Sometimes, the funding is met with opposition because of the frustrations that come with technology when it does not always work as

planned. It is met with acceptance when the computers run as they should and are effective in their usage by teachers and students. If the teachers are patient with the technology, and willing to extract its entire worth and value, the grant money will be well-used.

Computer technology in the classroom could be used in a myriad of teaching strategies and methods. The important point is that computers should not be used as a crutch to support an ineffective teacher. If computer technology is incorporated into the classroom, it should be utilized as a supplement to quality instruction. The teacher needs to develop an effective and strategic plan of how to effectively use the computer alongside the instruction given for the day. Additionally, there needs to be a back-up plan, in case the computer activities fail.

The use of computer technology in the classroom is an effective method of instruction that can be abused. It must be used by teachers as a supplement to instruction, and not solely as the principal form of teaching.

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Appendix A

Pre-Test

- 1) 1. Animal cells have all of the following EXCEPT
 - a) Golgi apparatus
 - b) Cell Membrane
 - c) Mitochondria
 - d) Chloroplasts
 - e) Nucleus
- 2) Which of these 5 statements is found in the cell theory?
 - a) The cell wall provides the cell with support and security.
 - b) Cells can arise spontaneously.
 - c) All cells have a nucleus.
 - d) Cells are the primary component of the arrangement and operation in things that are alive.
 - e) There are only 5 different types of cells.
- 3) Which of the organelles listed here have DNA?
 - a) Endoplasmic Reticulum
 - b) Mitochondria
 - c) Lysosomes
 - d) Golgi Apparatus
 - e) None of the above
- 4) Which of these organelles makes energy available for the cell?
 - a) Chloroplasts
 - b) Golgi Apparatus
 - c) Nucleolus
 - d) Mitochondrion
 - e) Endoplasmic Reticulum
- 5) If the cell of an organism has a nucleus in it, that organism is a(an)
 - a) Plant
 - b) Animal
 - c) Eukaryote
 - d) Prokaryote
 - e) None of the above
- 6) Which scientist is associated with the study of cells?
 - a) Anton von Leeuwenhoek
 - b) Albert Einstein
 - c) Isaac Newton
 - d) Louis Pasteur
 - e) Bill Nye, the Science Guy
- 7) What is the function of the cytoskeleton in a living cell?
 - a) To sustain the shape of the cell.
 - b) Movement
 - c) Contraction
 - d) To transport proteins throughout the cell.
 - e) To assist in cell division.

THIS PROJECT HAS BEEN REVIEWED BY THE INSTITUTIONAL REVIEW BOARD FOR THE PROTECTION OF HUMAN SUBJECTS AT THE UNIVERSITY OF TENNESSEE AT CHATTANOOGA.

- 8) Which of these choices is not an organelle?
- | | |
|--------------------|--------------------------|
| a) Muscle tissue | b) Endoplasmic Reticulum |
| c) Golgi Apparatus | d) Nucleus |

True and False

- 9) You can see most cells with your eyes.
a) True
b) False
- 10) Some cells can survive with no nucleus.
a) True
b) False
- 11) Plant cells contain organelles that are not in animals.
a) True
b) False
- 12) Ribosomes are not organelles.
a) True
b) False
- 13) Cells are equipped with a delicate fibrous network.
a) True
b) False
- 14) The powerhouses of the cell are called Endoplasmic Reticuli.
a) True
b) False
- 15) The word Eukaryotic means having two or more walls.
a) True
b) False
- 16) The surface of the Endoplasmic Reticulum appears rough due to the presence of ribosomes.
a) True
b) False
- 17) Any type of substance can travel through the cell membrane.
a) True
b) False
- 18) The cytoplasm is of greater importance in Eukaryotic cells than in Prokaryotic cells.
a) True
b) False

Matching: Fill in the blank with the correct answer. Use the words from the word bank.

Word Bank: Lysosome Chloroplast Mitochondria Golgi Complex/Apparatus Prokaryote Cell Membrane Nucleus
Cell Wall Endoplasmic Reticulum Eukaryote

- | | |
|---|-----------------------|
| 19) _ Proteins are stored here. | Chloroplast |
| 20) _ A cell that does not have a nucleus. | a. |
| 21) _ A unique vacuole that diminishes big molecules and parts of the cell. | Golgi Apparatus |
| 22) _ Site of photosynthesis. | b. |
| 23) _ The "Brain" of the cell. | Eukaryote |
| 24) _ Only in plant cells, where it gives support and security for the plant. | c. |
| 25) _ This is where energy in the form of ATP is made. | Lysosome |
| 26) _ The method of transportation in the cell. | d. |
| 27) _ A cell that has a nucleus. | Endoplasmic Reticulum |
| | e. |
| | Mitochondria |
| | f. |
| | Prokaryote |
| | g. |
| | Cell wall |
| | h. |
| | Nucleus |
| | i. |

- 28) Write out a description how Robert Hooke, Theodore Schwann, and Matthias Schleiden contributed to the discoveries in the cell theory.

- 29) 2. List some similarities and differences between Prokaryotic and Eukaryotic Cells.

- 30) 3. Briefly describe the structure of a cell membrane. Explain how it has an impact on the contents of the cell.

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Pre-Test Answer Key

- 1) 1. Animal cells have all of the following EXCEPT
 - a) Golgi apparatus
 - b) Cell Membrane
 - c) Mitochondria
 - d) Chloroplasts
 - e) Nucleus

- 2) Which of these 5 statements is found in the cell theory?
 - a) The cell wall provides the cell with support and security.
 - b) Cells can arise spontaneously.
 - c) All cells have a nucleus.
 - d) Cells are the primary component of the arrangement and operation in things that are alive.
 - e) There are only 5 different types of cells.

- 3) Which of the organelles listed here have DNA?
 - a) Endoplasmic Reticulum
 - b) Mitochondria
 - c) Lysosomes
 - d) Golgi Apparatus
 - e) None of the above

- 4) Which of these organelles makes energy available for the cell?
 - a) Chloroplasts
 - b) Golgi Apparatus
 - c) Nucleolus
 - d) Mitochondrion
 - e) Endoplasmic Reticulum

- 5) If the cell of an organism has a nucleus in it, that organism is a(an)
 - a) Plant
 - b) Animal
 - c) Eukaryote
 - d) Prokaryote
 - e) None of the above

- 6) Which scientist is associated with the study of cells?
 - a) Anton von Leeuwenhoek
 - b) Albert Einstein
 - c) Isaac Newton
 - d) Louis Pasteur
 - e) Bill Nye, the Science Guy

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 - a) To sustain the shape of the cell.
 - b) Movement
 - c) Contraction
 - d) To transport proteins throughout the cell.
 - e) To assist in cell division.

- 8) Which of these choices is not an organelle?
 - a) Muscle tissue
 - b) Endoplasmic Reticulum
 - c) Golgi Apparatus
 - d) Nucleus

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True and False

- 9) You can see most cells with your eyes.
 - a) True
 - b) False
- 10) Some cells can survive with no nucleus.
 - a) True
 - b) False
- 11) Plant cells contain organelles that are not in animals.
 - a) True
 - b) False
- 12) Ribosomes are not organelles.
 - a) True
 - b) False
- 13) Cells are equipped with a delicate fibrous network.
 - a) True
 - b) False
- 14) The powerhouses of the cell are called Endoplasmic Reticuli.
 - a) True
 - b) False
- 15) The word Eukaryotic means having two or more walls.
 - a) True
 - b) False
- 16) The surface of the Endoplasmic Reticulum appears rough due to the presence of ribosomes.
 - a) True
 - b) False
- 17) Any type of substance can travel through the cell membrane.
 - a) True
 - b) False
- 18) The cytoplasm is of greater importance in Eukaryotic cells than in Prokaryotic cells.
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 - b) False

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Matching: Fill in the blank with the correct answer. Use the words from the word bank.

Word Bank: Lysosome Chloroplast Mitochondria Golgi Complex/Apparatus Prokaryote Cell Membrane Nucleus
Cell Wall Endoplasmic Reticulum Eukaryote

- | | |
|---|-----------------------------|
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<u>B</u> | Chloroplast
a. |
| 20) A cell that does not have a nucleus.
<u>G</u> | Golgi Apparatus
b. |
| 21) A unique vacuole that diminishes big molecules and
<u>D</u> parts of the cell. | Eukaryote
c. |
| 22) Site of photosynthesis.
<u>A</u> | Lysosome
d. |
| 23) The "Brain" of the cell.
<u>I</u> | Endoplasmic Reticulum
e. |
| 24) Only in plant cells, where it gives support and security
<u>H</u> for the plant. | Mitochondria
f. |
| 25) This is where energy in the form of ATP is made.
<u>F</u> | Prokaryote
g. |
| 26) The method of transportation in the cell.
<u>E</u> | Cell wall
h. |
| 27) A cell that has a nucleus.
<u>C</u> | Nucleus
i. |
- 28) Write out a description how Robert Hooke, Theodore Schwann, and Matthias Schleiden contributed to the discoveries in the cell theory.
Cork slices were observed by Mr. Hook and he gave them the name cells. It was Mr. Theodore Schwann who came to the conclusion that all animals of this world have cells in them. A discovery was made by Mr. Matthias Schleiden that there are cells in all of the plants of the world. The final scientist, Mr. Virchow, made a discovery that cells do not grow larger, they actually are a regeneration of the cell that was already there.
-
- 29) 2. List some similarities and differences between Prokaryotic and Eukaryotic Cells.
Prokaryotes and Eukaryotes both have cytoplasm and a cell membrane surrounding the cell. A similarity between them is the ability to perform growth operations of life, reproduction, and effects. A difference of prokaryotes is that every type of bacteria is a prokaryote. In Eukaryotes there is a nucleus and cell organelles. Eukaryote examples are animals, plants, fungi, and a lot of microorganisms.
-
- 30) 3. Briefly describe the structure of a cell membrane. Explain how it has an impact on the contents of the cell.
In the cell membrane's core there is a thing called a lipid bilayer. There are molecules of protein that carry with them carbohydrates and they all enter the cell membrane. The proteins are responsible for the development of canals and pumps that provide access for particles to go through the cell membrane.
-

Appendix B

Post-Test

- 1) 1. Animal cells have all of the following EXCEPT
 - a) Golgi apparatus
 - b) Cell Membrane
 - c) Mitochondria
 - d) Chloroplasts
 - e) Nucleus
- 2) Which of these organelles makes energy available for the cell?
 - a) Chloroplasts
 - b) Golgi Apparatus
 - c) Nucleolus
 - d) Mitochondrion
 - e) Endoplasmic Reticulum
- 3) If the cell of an organism has a nucleus in it, that organism is a(an)
 - a) Plant
 - b) Animal
 - c) Eukaryote
 - d) Prokaryote
 - e) None of the above
- 4) Which scientist is associated with the study of cells?
 - a) Anton von Leeuwenhoek
 - b) Albert Einstein
 - c) Isaac Newton
 - d) Oprah Winfrey
 - e) Bill Nye, the Science Guy
- 5) Which of these choices is not an organelle?
 - a) Muscle tissue
 - b) Endoplasmic Reticulum
 - c) Golgi Apparatus
 - d) Nucleus

True and False

- 6) Some cells can survive with no nucleus.
 - a) True
 - b) False
- 7) Plant cells contain organelles that are not in animals.
 - a) True
 - b) False
- 8) Ribosomes are not organelles.
 - a) True
 - b) False
- 9) Cells are equipped with a delicate fibrous network.
 - a) True
 - b) False

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- 10) The powerhouses of the cell are called Endoplasmic Reticuli.
 a) True
 b) False

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- 11) The word Eukaryotic means having two or more walls.
 a) True
 b) False
- 12) The surface of the Endoplasmic Reticulum appears rough due to the presence of ribosomes.
 a) True
 b) False
- 13) Any type of substance can travel through the cell membrane.
 a) True
 b) False

Matching: Fill in the blank with the correct answer. Use the words from the word bank.

Word Bank: Lysosome Chloroplast Mitochondria Golgi Body Prokaryote Nucleus Cell Wall Endoplasmic Reticulum Eukaryote

- | | |
|--|-----------------------|
| 14) _ Packaging of proteins. | Chloroplast |
| 15) _ A cell with no nucleus. | a. |
| 16) _ Helps with digestion like a recycling center. | Golgi body |
| 17) _ Food is made here by photosynthesis. | b. |
| 18) _ The control center of the cell. | Eukaryote |
| 19) _ Only in plant cells, where it gives support and security
_ for the plant. | c. |
| 20) _ This is where energy in the form of ATP is made. | Lysosome |
| 21) _ The method of transportation in the cell. | d. |
| 22) _ A cell that has a nucleus. | Endoplasmic Reticulum |
| | e. |
| | Mitochondria |
| | f. |
| | Prokaryote |
| | g. |
| | Cell wall |
| | h. |
| | Nucleus |
| | i. |

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Post-Test Answer Key

- 1) 1. Animal cells have all of the following EXCEPT
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 - b) Cell Membrane
 - c) Mitochondria
 - d) Chloroplasts
 - e) Nucleus
- 2) Which of these organelles makes energy available for the cell?
 - a) Chloroplasts
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 - c) Nucleolus
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- 5) Which of these choices is not an organelle?
 - a) Muscle tissue
 - b) Endoplasmic Reticulum
 - c) Golgi Apparatus
 - d) Nucleus

True and False

- 6) Some cells can survive with no nucleus.
 - a) True
 - b) False
- 7) Plant cells contain organelles that are not in animals.
 - a) True
 - b) False
- 8) Ribosomes are not organelles.
 - a) True
 - b) False
- 9) Cells are equipped with a delicate fibrous network.
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 - b) False

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 b) False
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Matching: Fill in the blank with the correct answer. Use the words from the word bank.

Word Bank: Lysosome Chloroplast Mitochondria Golgi Body Prokaryote Nucleus Cell Wall Endoplasmic Reticulum Eukaryote

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| 16) <u>D</u> Helps with digestion like a recycling center. | c. Eukaryote |
| 17) <u>A</u> Food is made here by photosynthesis. | d. Lysosome |
| 18) <u>I</u> The control center of the cell. | e. Endoplasmic Reticulum |
| 19) <u>H</u> Only in plant cells, where it gives support and security for the plant. | f. Mitochondria |
| 20) <u>F</u> This is where energy in the form of ATP is made. | g. Prokaryote |
| 21) <u>E</u> The method of transportation in the cell. | h. Cell wall |
| 22) <u>C</u> A cell that has a nucleus. | i. Nucleus |

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Using Probeware Technology to Teach pH Chemistry:

A Pre-test and Post-test Evaluation

Scott C. Siegel

EDUC 590, Spring 2007

The University of Tennessee at Chattanooga

The Institutional Review Board of The University of Tennessee at Chattanooga (FWA00004149) has approved this research project 07-040.

Introduction to the Problem

Today's high schools offer students a wide variety of educational opportunities. Students may now select different types of diplomas, career paths, and special programs. Students also are able to select from a significant amount of elective courses. With this variety of opportunities comes internal competition for school resources. There is competition among programs for students and for the necessary funding to keep the programs up to current standards. The sciences taught at the 11th and 12th grade levels, chemistry and physics, are part of this competition. Today's chemistry and physics laboratories can be equipped with an impressive array of scientific equipment.

Scientific equipment known as probeware is now available for use in high schools. Probeware is a term used to describe a hardware and software system that allows students to employ modern equipment in the high school laboratory. A probeware combination is generally composed of a computer (or calculator), a data interface, and a sensor. The sensor is designed to measure a specific data set in a laboratory experiment or simulation. Commercially available sensors range from thermometers and microphones, to sensors that measure the magnetic field at a specific point.

Twenty years ago, probeware was used primarily by research scientists. Very few students would have had access to equipment of this kind. However, as the cost of technology is being driven down, probeware is becoming increasingly popular in the high school science laboratory.

As I began to stock a modern high school physics and chemistry laboratory, I invested in a probeware system. I am increasingly impressed by the variety of measurements the system can collect. However, I am more interested in the educational

value of the system. Will my students better understand the concepts I teach if they are able to use probeware in the lab? The goal of this project is to measure the impact of using probeware as a tool for subject matter reinforcement.

Review of Literature

Technology is becoming commonplace in today's secondary schools. Personal computers, laptops, and smart boards are very popular items. Modernization of the classroom allows the student to use the equipment that a professional might use on the job or in the office. Clark (2006) states that assignments should replicate the use of technology found in the workplace. Probeware is designed to create these authentic educational opportunities for the science student (Banas & Zeiler, 2004).

Probeware provides practical experience in data collection and data analysis (Durick, 2001). Probeware introduces the student to technology that is used by scientists and researchers. If the student is going to learn about topics such as the scientific method, it makes sense to teach them with the tools of the scientist (Marcum-Dietrich & Ford, 2002).

Teachers and students have found that probeware allows for fast and simple data collection. The software that receives the data allows for immediate upload, as well (Hisim, 2005). Some software packages can produce graphs and tables with the data. Probeware can collect data more accurately than was previously possible in a science classroom (Hisim, 2005). For example, acids and bases have been identified in lab experiments for many years. However, they typically required the use of litmus paper that could only identify a substance as an acid or a base. Using probeware, a student can find the specific pH of a given substance (Christmann & Holy, 2005).

Probeware is also more versatile than standard lab equipment. First, probeware can be taken outside of the classroom. Readings can be taken in the field and later brought back for upload into a personal computer (Banas & Zeiler, 2004). Second, probeware can be programmed for automatic data collection. This reduces the monotony of waiting on a long process to come to a finish (Marcum-Dietrich & Ford, 2002).

The use of probeware provides the student authentic data instead of facts from a textbook. This allows the student to make connections between the real-time readings and what is physically occurring in the lab (Millar, 2005). Probeware allows the student to be an active participant in that laboratory (Martinez-Jimenez, Pontes-Pedrajas, Polo, & Climent-Bellido, 2003). In addition, the use of probeware makes the assignment more rigorous and scientifically accurate (Banas & Zeiler, 2004).

The effect of using probeware on student learning is beginning to be documented. One study reports that the use of these data acquisition systems may increase the student's critical thinking skills (Millar, 2005). Professionals learn from field experience, and using probeware gives the students exposure to the scientific environment (Hurwitz & Abegg, 1999). In another study involving probeware in a biology lab, students in the lowest quartile show significant improvement after performing laboratory assignments using probeware (Marcum-Dietrich & Ford, 2002). It was reasoned that the graphical representation of the data collected assisted in the student's understanding of the experiment (Marcum-Dietrich & Ford, 2002). Millar (2005) states that when students get a chance to reach their own conclusions independently, they are more likely to retain those conclusions. The instantaneous data analysis performed by probeware aids this process.

The use of probeware has other effects beyond understanding science concepts. Technology is reported to generate equity in the classroom. As the use of the probeware is moved from student to student, the less assertive persons are given opportunities to lead (Hurwitz & Abegg, 1999). Technology can help expand the learning culture of a classroom or school. An environment can be created in which the student learning is supported by investigations rather than communicated by the teacher (McRobbie & Thomas, 2000). Having a reliable technical infrastructure to support thinking and learning contributes to the overall school culture (Clark, 2006).

For the administrator, the cost of new technology is an important consideration. However, there are some positive aspects of probeware from the financial side. Jones (2000) reports that there is less waste of necessary chemicals using probeware. Some instruments, such as temperature probes, can take readings from small test tubes. Durick (2001) points out that, due to the ongoing price reductions on personal computers, funds can be made available to purchase probeware and still procure the necessary computers.

Data Collection and Results

The question this paper attempts to answer is whether or not using probeware technology helps students learn the subject matter. The method of data collection will be a pre-test and post-test given to determine if knowledge is gained after using the equipment. A questionnaire will also be used to gather data from the participants.

The participants involved in this study are 11th grade chemistry students. The students attend a suburban public high school in northwestern Georgia. The chemistry class is designed for college-bound students, but it is not an honors course. There are two

groups involved in the study. The control group consists of 16 students and the experimental group consists of 22 students.

The subject matter used for this study is pH chemistry. The students involved in the study were introduced to this subject in past classes, most notably from a mandatory physical science course that they completed in the ninth grade. Because of their reasonable familiarity to the pH scale, they should show some prior knowledge in the pre-test. The probeware technology used in the project is a pH sensor in combination with a data interface and laptop computer.

I began this study by asking the students from both the experimental group and the control group to complete a pre-test (see Appendix A). Because a pre-test and post-test methodology is used in this high school frequently, the students did not think of the pre-test as unusual. I told the students that this assessment was a pre-test and the results would not affect their grade in the class. I also encouraged them to give their best effort in answering the questions. The students were not given a specific time limit, but all the students submitted their pre-test after 10 minutes of work.

After the pre-test, I taught a short lesson about pH chemistry to both the control group and the experimental group. Topics covered included the definitions of acids and bases, H^+ and OH^- ion concentrations, indicators, the pH scale, and examples of acids and bases. I was sure to cover all questions on the pre-test and post-test. These subjects were taught over 2 days.

At the end of the second day of the study, the post-test administered. There was no difference in the pre-test and post-test. No time was given to either group to study the

material presented. The control group took the post-test immediately after the second day's lesson and then moved on to other topics.

After I finished teaching the second lesson to the experimental group, the students were moved to the laboratory and given instructions for performing a lab exercise using pH chemistry. The students were instructed to test the pH of six different samples that were prepared for them. They were to use litmus paper, cabbage juice, and a pH sensor with an interface and a laptop computer, as the indicators. Each of the indicators was located at an individual station, with the probeware being the last station to be visited. The students were given a demonstration of how to properly use the pH sensor. The students were given approximately 40 minutes to perform this lab, but no student needed more than 30 minutes to complete the work.

After the experimental group finished with the laboratory work, they were given the post-test. This ensured that the control group and the experimental group took the post-test on the same day. I did not give any review to the experimental group before the post-test started. Also, I did not allow any studying so that the conditions were similar to those of the control group.

On the day after I gave the post-test, I asked the experimental group to complete a questionnaire (see Appendix B). The questions were specifically about the probeware and the student's reactions to using the technical equipment. The responses were designed based on a Likert scale (1 to 5). The purpose of this questionnaire was to gain student perspective on using the probeware.

Data Analysis

The test used as the pre-test and post-test consisted of 25 questions. Each of the questions was given a value of 4 points. The test consisted of multiple choice, fill in the blank, and true or false questions. There were no essay questions or subjective questions included in the test.

The pre-tests were graded first. The control group had a mean score of 38.3%. The experimental group had a mean score of 38.4%. These numbers suggest that the background knowledge for both of the groups was very close, if not identical. The fact that both of the groups scored so well on the initial test is indicative of their previous knowledge from physical science.

The grades from the post-test also provided interesting results. The control group had a mean score of 51.4%. This group scored an average of 13.1 points higher on the post-test than on the pre-test. The control group showed an improvement of 34.2%. Since the control group had no reinforcing activity, I felt the amount of improvement was commendable.

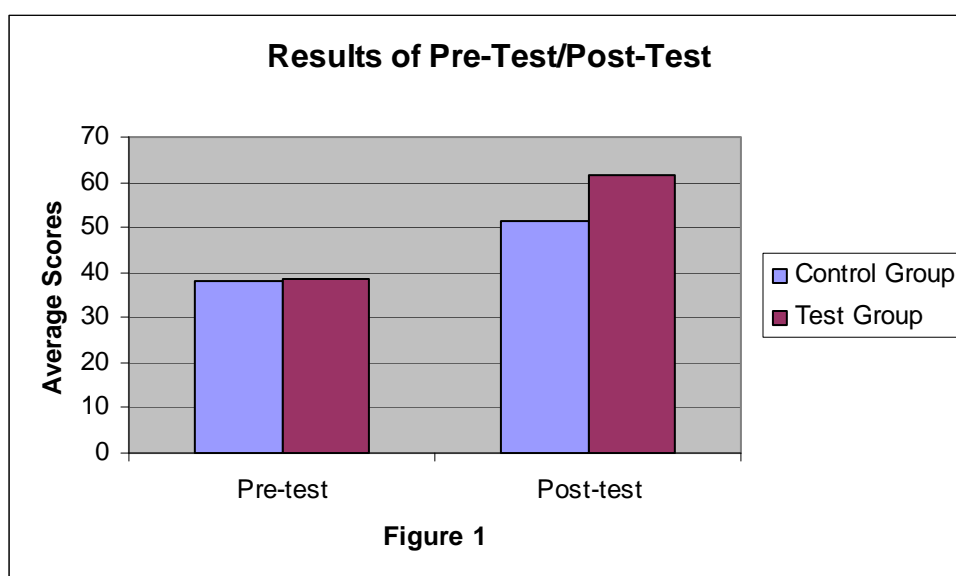


Figure 1. Mean scores from the pre-test/post-test.

The data from the experimental group was also very revealing. The experimental group's mean score was 61.8%. This group scored an average of 23.4 points higher on the post-test than on the pre-test. The experimental group therefore showed an average improvement of 60.9% over their scores on the pre-test. I expected the test group to score higher on the post-test. However, the mean score from the experimental group was over 10 points higher than that of the control group. The test results are shown graphically in Figure 1.

Only the experimental group took the questionnaire because they were the only class to perform the laboratory. The results were tabulated and a mean score was obtained for every question. These results are shown in Figure 2. The answers to most of the questions tended to be toward "strongly agree" and "strongly disagree." As a result, the answers to each question were very definite. The students gave answers that were very positive. Through this questionnaire, they reported that they enjoyed working with this equipment (questions 1 and 5) and they learned more about chemistry because of the lab equipment (questions 4 and 6).

Question Number	Question	Average Response
1	I enjoyed working on the pH Lab.	3.9
2	At first, I was intimidated by the lab equipment.	1.8
3	I learned how to use the equipment quickly.	4.4
4	Using the new lab equipment made learning about pH easier.	4.2
5	Using the lab equipment made learning about pH more enjoyable.	4.1
6	I feel that I know more about pH because of this lab work.	3.9
7	I would like to use the computer technology equipment in a future lab.	4.2

Figure 2. Average responses to the post-lab questionnaire.

Conclusions and Recommendations

As a teacher who is currently using probeware and other technologies, I am very encouraged by the results of this project. This study shows two important findings about incorporating technology in a chemistry lab. First, students will have a tendency to better understand the content matter if lecture is followed by a technology-based laboratory exercise. The difference in the scores for the control group and the experimental group was over 10 percentage points. This study also shows that, from a student's perspective, there is no reason to avoid using the probeware. The students responded favorably about using this technology. There is reason to believe that students will enjoy working with other probeware applications.

As I performed this project, I continuously thought of other variations that could be explored using action research. For further research, one might investigate how well the students enjoy using other types of probeware besides the pH sensor. Another topic might be to investigate if the student learns more about pH using the litmus paper versus using the pH sensor. Also, one might investigate if the results in this study were actually due to the use of the laboratory technology versus just the amount of time exposed to the topic.

When I reflect on the financial commitment involved in assembling a quality science laboratory, I am now firm in my belief that using school funds to create a modern science environment is money well spent. The return on this investment will be an authentic scientific learning experience for all of the students who use the probeware technology.

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Appendix A

Pre-Test and Post-Test

True or False

1. Acids taste sour.
2. Bases are odorless and have no taste.
3. NaOH is a strong base.
4. Acetic acid is produced in the stomach.
5. The pH of pure water is 10.0.

Fill in the Blank

6. When acids neutralize bases, _____ and water are produced.
7. Acids turn litmus paper _____.
8. The formula for the hydronium ion is _____.
9. An Arrhenius acid increases the number of _____ atoms.
10. A triprotic acid may donate as many as _____ protons.

Multiple Choice

11. You can expect lemon juice to have a pH close to _____.
a. 1 b. 3 c. 8 d. 12
12. Red cabbage juice is used as a(n):
a. acid b. addition c. indicator d. solution
13. A compound with a formula NaOH is a(n):
a. soft drink b. acid c. predictor d. base
14. You can expect baking soda to have a pH close to _____

- a. 1 b. 3 c. 8 d. 12

15. H^+ is known as a hydrogen _____.

- a. atom b. isotope c. ion d. acid

16. Drain cleaner has a pH of 12. It is extremely:

- a. acidic b. smooth c. resistant d. basic

17. A compound with the formula HNO_3 is a(n):

- a. indicator b. base c. acid d. metal

18. Ammonia has a pH of approximately 8.3. If it is mixed with cabbage juice it will turn:

- a. pink b. blue c. yellow d. red

19. Litmus paper is used as a(n):

- a. worksheet b. activator c. nitrate d. indicator

a

20. According to Arrhenius, a base will increase:

- a. hydroxide ions b. hydrogen c. the pOH d. 14-pH

21. Acids taste:

- a. slippery b. sour c. bitter d. sweet

22. Cleaning products are usually:

- a. acids b. bases c. salts d. indicators

23. _____ can conduct electricity.

- a. acids b. bases c. both a and b d. neither a nor b

24. Hydrochloric acid can be found in:

- a. your stomach b. your blood c. orange juice d. chocolate

25. Detergent will turn litmus paper:

- a. yellow b. green c. blue d. red

Appendix B

Chemistry Laboratory Questionnaire

Please circle the number that best reflects your opinion about each of the following statements. Use the scale below to select your answer.

- 1 – strongly disagree
- 2 – mildly disagree
- 3 – neutral
- 4 – mildly agree
- 5 – strongly agree

1. I enjoyed working on the pH lab.

1 2 3 4 5

2. At first, I was intimidated by the lab equipment.

1 2 3 4 5

3. I learned how to use the equipment quickly.

1 2 3 4 5

4. Using the new lab equipment made learning about pH easier.

1 2 3 4 5

5. Using the lab equipment made learning about pH more enjoyable.

1 2 3 4 5

6. I feel that I know more about pH because of this lab work.

1 2 3 4 5

7. I would like to use the computer technology equipment in a future lab.

1 2 3 4 5

Writing to Learn

Tina Varnell

Education 590, Spring 2007

The University of Tennessee at Chattanooga

The Institutional Review Board of The University of Tennessee at Chattanooga (FWA00004149) has approved this research project 06-212.

Introduction to the Problem

In traditional middle and high schools, math classes are mainly taught by demonstrating and lecturing about the skills needed to solve math problems. Even though students learn how to solve a problem, they often do not understand how they did it. Many claim, “I can do it, but I cannot explain it.” Therefore, very seldom do educators find a math teacher who incorporates writing into the classroom. As a result, I believe that students would better comprehend math if they explained mathematical concepts in words. Therefore, the purpose of this study is to describe the impact of using narrative writing with middle school mathematics students to increase mathematics concept mastery.

Review of Literature

Writing, the transmission of information, is a system of communication that has developed into a mode for learning, which encourages thinking and understanding (Tynjälä, 2001). When students write what they are thinking, there exists a relationship between thought and language. Thinking in the mind allows students to write the language (words) of their thoughts (Vygotsky, 1978). When students are able to express in writing what they are thinking, they develop a skill that will last a lifetime. Written communication is important for success (Knipper & Duggan, 2006). If students can explain mathematical ideas in narrative form, they can demonstrate that the process of thinking is correct.

The relationship between writing and learning is complicated. Even though writing might produce positive learning results, there is no guarantee that better learning outcomes and methods will be produced in the classroom (Tynjälä, 2001). Learning takes

place every day in school, and, depending on the way writing is used, it will vary the learning outcome.

Writing can enhance learning in four broad areas. The first is spontaneous idea generation, also known as “free-writing.” This process commences when students do not know what to write. Therefore, they start to invent ideas. Forward search hypothesis is the second area. Teachers can use forward search hypothesis as a research paper. Students write the first draft in order to review it to enable progress. The third area is genre hypothesis, which is the manner in which students organize their information. This takes place in personal writing, note-taking, and journals. Last, backward search hypothesis involves students setting goals and revising these later to incorporate the new information (Tynjälä, 2001). This can be integrated into the class using many different methods.

However, when teachers think about incorporating writing into the classroom, they realize that this appears to be easy for all content areas except for math (McIntosh, 1991). Math teachers do not relish integrating writing into the classroom. Teachers believe that they will have to teach, rather than incorporating, writing strategies into math. Therefore, writing to learn is used to enhance the learning process, not merely to add another task to the teacher’s duties (Vukovich, 1985). All other content areas encompass writing into the classroom. Only recently has writing been added to the math realm of school (Mayer & Hillman, 1996).

The typical class in math focuses on the three following areas: introduction to the lesson, examples, and student practice. However, lessons such as these leave students wondering, “How can I follow the steps to arrive at an answer, but cannot justify it?”

Therefore, writing to learn has been known to open the students' minds, which connects understanding of the concept with written words. However, students do not believe that writing is a part of math. Joan Countryman (1992, p. 2) tells her students, "This is math. You know, it's fine to get the right answer, but what good is that answer if you can't explain it to anyone?"

According to McIntosh (1991), writing to learn is a method for teachers that helps students learn and assesses whether or not this is occurring. When students have to explain a problem in words, they must first fully comprehend it. If they do not understand the problem, writing will help them to realize their learning gaps or misconceptions.

Writing to learn has positive attributes, including the increase of communication between teacher and students. Communication allows the teacher to understand what students grasp, what they do not understand, what they like or dislike, and what they care about or reject as they study math (Countryman, 1992). Students also understand that the teacher reads thoroughly what they have written and that all remarks are personal.

As previously mentioned, writing can be organized into four areas. To narrow these areas, teachers can create many ways of writing in the classroom and tailor them to suit students' needs. The following methods are appropriate: learning logs, journals, free writing, autobiographies, math problems, formal papers, and test questions. Teachers need to adopt the strategies that work best in their classrooms (McIntosh, 1991). Various writing techniques give students a choice of ways through which their understanding of math will be enhanced. For example, journals are a good approach. It allows the student to feel comfortable and to reflect on their process of solving problems (Burns & Silbey, 2001). Also, the benefit of using writing during a test is that writing will surpass the

knowledge and comprehension level of learning. It will also display the process by which students think when solving a problem, which is more evident through writing than with numbers. When teachers score the writings, they will receive immediate insights into their students' understanding (Countryman, 1992). Writing in math class can dispel a student's notion that math is only a compilation of right and wrong answers.

When writing to learn, students put into words the ideas that come to them. This is quite a different concept than writing to show what has been learned from the teacher or the text. It allows students to answer questions that lie in wait in the back of their minds, and different types of writing can affect several attributes of student learning.

The National Council of Teachers of Mathematics (1989) published *Curriculum and Evaluation Standards for School Mathematics*, a report that reflects the new thinking about changes in the math curriculum. About 54 standards are presented in the report, which gives information relevant to presenting new methods into the classroom. These standards point out that to know math is to engage students in a search to understand and communicate. One standard for students in grades 9 - 12 is that they can express mathematical ideas orally and in writing (Countryman, 1992). Therefore, since the standards are changing, teachers need to change their techniques of instruction. Writing to learn is a good technique for teachers to use in order to comply with standards.

Data Collection and Results

Data Collection

Methodology

The subjects of the study were 23 students in an Algebra I class at a Hamilton County magnet school. Of this number, six were African-American, and the remainder

were white. One student was gifted. Only two students in the class had a difficulty with math.

The purpose of the study was to learn how students study math and their attitudes about this subject. Consent forms were required from each pupil desiring to participate, as well as from their parents. After the forms were collected, a pre-test was administered which contained questions regarding student attitudes toward math, how they best learn it, and their opinions toward writing about it.

Pre-surveyt

When asked which their favorite subject was, 10 of 23 students chose math. The other 13 variously selected gym, history, music, art, Spanish, or French. Most agreed that math is both fun and interesting. Two students reported that, although they did not consider math fun or interesting, neither was it boring or dull. The wording of these questions was important because information is gleaned (and knowledge assimilated) in differing ways. Feedback from the questions indicated that most students surveyed were visual learners. Next were those who learned most easily through auditory means and students who depended on peers for help. The least number of those surveyed required hands-on experience or one-on-one bouts with the teacher. These results emphasize how important it is for teachers to practice varied forms of instruction in class. The pre-survey is presented in Appendix A.

The students' attitudes toward writing in class were generally negative. Only six indicated that they enjoyed it. Seventeen students reported that they do write in math class, but I suspect that they misunderstood the question. However, 16 clearly affirmed that they did not desire to write while in class.

Process

After the analysis of the pre-survey was completed, the research began. Math instruction remained constant, but the homework strategies changed. Students had to solve selected math problems while explaining them on paper. They were required to use complete sentences as they explained, step-by-step, the process they followed in order to solve the problem. Some questions, however, tested their ability to understand different types of mathematical concepts.

The teacher explained how to write the steps in order to clarify and understand the problem. She might say, “If the teacher places a problem on the board and asks a student to explain it, what will the student do?” Of course, the answer is that the student would explain the steps aloud. This is correct and the precise information needed, but the steps should be written, rather than spoken. After this example, students were given a handout to complete that consisted of a single word problem with three questions to answer. First, the problem must be solved. Then the following three questions were to be answered, using complete sentences using the student’s own words: What is the problem? What was your approach to the problem? What did you find out? This was a successful activity. Many students used these essential three questions to help them answer other problems, which they could now explain in words. After the lesson was finished, the students were given a homework assignment emphasizing what they had done in class. Only five students did poorly on this problem, because they did not explain the process clearly enough to be understood.

Over a 3-week period, students were to complete questions written in narrative form. Initially, I had students who complained about the homework assignments. A

frequent comment was, “I know how to do it. Why do I have to explain it?” I explained that writing helps both them and others to learn the “hows” and “whys” of each problem. Toward the end of the period, I was gratified to see much improvement in the writings and attitudes about the assignments.

Findings

The homework assignments were an integral part of the research. Of the 23 students, only 2 failed to turn in homework assignments. One student was missing three, while another was missing one. Homework scores ranged from one to four, except for one assignment which was five points. A score of four indicated that the questions were answered thoroughly, written clearly, and explained in an understandable fashion. A “three” meant that the student did not use words as part of the answer, that his writing was not very clear, or was difficult to understand. A score of “two” meant that the answer was not clear and was not given entirely in words. The lowest score was “one,” indicating only sparse writing and very short, unclear answers. Only about five students received scores of one or two, which showed that little or no effort was expended. Most of the scores were threes and fours. There were 10 assignments that the students were assigned to complete. One student scored perfect scores on all the homework. Overall, most students did very well on their homework assignments. The lowest score was 21.5. (See Figure 1.)

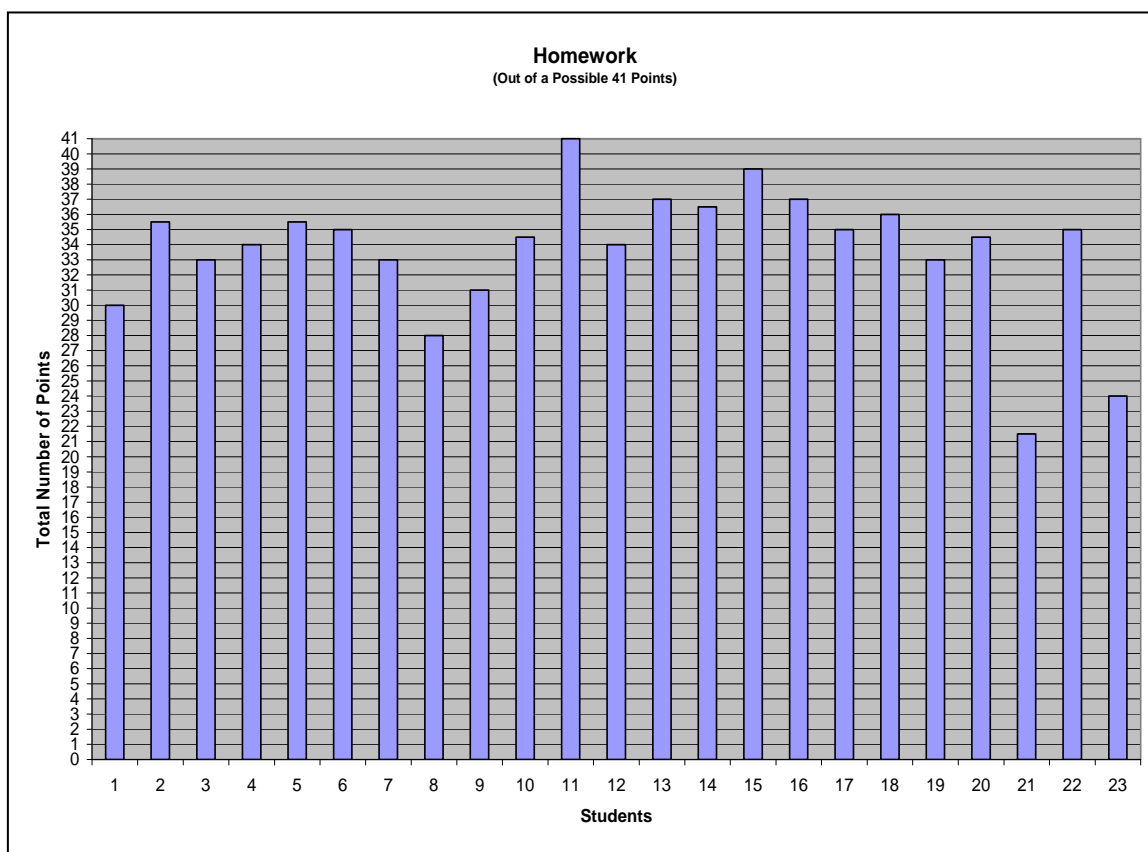


Figure 1. Homework points.

Post-survey

Upon analyzing the post-survey, only about five students enjoyed writing in the math. However, 13 students said that the narrative writing helped them in problem solving. Also, about 14 students said that the writing helped them better understand the concept that was taught by writing the steps. From the comments students left on the post-survey, it was recognizable that the lower students in the class did better on the writing, and commented that the writing helped them better understand the topic and how to do the problem. The post-survey is presented in Appendix B.

When asked if writing change their attitude toward math, four students said it did. One commented that it showed a different type of math. Another said that it brought out a

new way to understand what was happening. Also, it made the concepts better understandable.

Students were asked how they felt about the writing assignment. All the students felt differently. Some thought that it was unnecessary for them, while others said that it assisted them in solving problems.

Conclusion and Recommendations

Conclusions

It seems that students who struggle in math benefited from the writing assignments. The higher students in the class did not enjoy the writing assignments because they already knew how to do the math, so they did not need to write the answer and problem. However, the lower students benefited from the assignments. Many explained that writing helped them see the problem and how to do the problem. They could see math in a different light. Some of the students enjoyed and liked math better because of the writing.

Recommendations

Further research needs to be done on the topic. Narrative writing in the mathematics classroom can benefit all students. Besides only having the writings for different homework problems, narrative writing can be incorporated in the classroom in numerous ways by journal writing, essays, reflections, or answers to word problems. Narrative writing in math allows students to think and better process the information.

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Appendix A

Name: _____

Survey of Math
Pre-survey

Directions: Please answer the following questions. If you have a question, please raise your hand.

Attitude toward Math

1) Is math your favorite subject?

☐ No ☐ Yes

2) If math is not your favorite subject, what subject is?

☐ English ☐ Science ☐ History ☐ Art ☐ Music☐ Other: _____

3) Do you find math interesting and fun?

☐ No ☐ Yes

4) Do you find math boring and dull?

☐ No ☐ Yes**Learning Math**

5) How do you best learn math?

☐ Visual (examples) ☐ Hands-on (Manipulatives)☐ Peer help ☐ One-on-one with teacher☐ Auditory (hearing the lesson)☐ Other: _____

6) How do you study for a test?

☐ Night before☐ In advance (weeks before the test)☐ I don't

☐ Other: _____

7) How do you work on your homework?

☐ Sit at a desk in my room

☐ Sit at the kitchen table

☐ Sit on the bed

☐ Other: _____

8) When you work on your homework is it

☐ Quiet ☐ Music playing

Attitude toward Writing

9) Do you enjoy writing?

☐ No ☐ Yes

10) Do you write in math class?

☐ No ☐ Yes

11) Would you like to write in math class?

(Example: Write in words how to solve a problem)

☐ No ☐ Yes

THIS PROJECT HAS BEEN REVIEWED BY THE INSTITUTIONAL REVIEW
BOARD FOR THE PROTECTION OF HUMAN SUBJECTS AT THE UNIVERSITY
OF TENNESSEE AT CHATTANOOGA.

Appendix B

Name: _____

Survey of Math
Post-survey

Directions: Please answer the following questions. If you have a question, please raise your hand.

Attitude toward Writing

12) Do you enjoy writing in math class?

☐ No ☐ Yes

13) Did the narrative writing help you in problem solving?

☐ Yes ☐ No

14) Explain your answer in #2. Why?

15) Did you better understand the concept that was taught by writing out the steps?

☐ No ☐ Yes**Attitude toward Math**

16) Did narrative writing change your attitude toward math?

☐ No ☐ Yes

17) If you said, "Yes," explain?

18) Explain what your feelings were toward the writing assignments.

THIS PROJECT HAS BEEN REVIEWED BY THE INSTITUTIONAL REVIEW BOARD FOR
THE PROTECTION OF HUMAN SUBJECTS AT THE UNIVERSITY OF TENNESSEE AT
CHATTANOOGA.

Can Mathematics Avoidance Be Avoided?

Kara White

Education 590, Spring 2007

The University of Tennessee at Chattanooga

The Institutional Review Board of The University of Tennessee at Chattanooga (FWA00004149) has approved this research project 07-007.

Introduction to the Problem

“I hate math.” “I don’t know why I have to take these classes.” “When am I ever going to use this stuff, anyway?” “I’m not even trying to do my homework because I don’t understand any of it, and I know I’ll get the wrong answers, even if I try.” “I’ve never been good at math, and I know this year will not be any different.”

Statements like the ones above are often heard by mathematics teachers from discouraged students. Mathematics has been a major part of the core curriculum in our education system and remains a key component today. However, many American students fall behind in mathematics and have a very negative attitude towards mathematics. This negative attitude towards mathematics is not a new development; it has existed in classrooms across the United States for many years. This negative attitude is often referred to as “mathematics avoidance” or “mathematics anxiety.”

I am currently studying to become a middle grades mathematics teacher. Therefore, I am disheartened by the idea of mathematics avoidance, and the effect it may have on student learning of mathematics. I want all students in my classroom to succeed in learning mathematics, and hope to instill a positive attitude in them about mathematics. In order to try to help create a positive environment and experience for my students, I am interested in looking at the following issues regarding mathematics avoidance:

- ♦ Major causes of mathematics avoidance.
- ♦ Effect of attitude towards mathematics on achievement in mathematics courses.
- ♦ Effect of achievement in mathematics courses on attitude towards mathematics.

- ♦ Role gender plays in mathematics avoidance, if any.
- ♦ Changes that may help eliminate mathematics avoidance.

I am conducting an action research project that will help me find the answers to these questions. The purpose of this project is to determine what I can do, as a teacher, to change the negative attitude many students have towards mathematics, and enhance learning of mathematics.

Variables

There will be some variables that may have an effect on student learning of mathematics, that may, in turn, have an effect on this study. The first variable is class size. All classes studied may not have the same number of students in the class. Therefore, smaller class sizes, where more attention can be given to each student, may have an advantage over a larger class, where students do not have much individual time with the teacher. The second variable may be the time of day mathematics is taught. Some students may learn mathematics better at certain times of the day. Therefore, students who are in a class that is scheduled during the time of day when they are most focused may have a higher achievement rate than students who are in a mathematics class during a time of day when they are less focused.

Research Questions

- ♦ What are the major causes of mathematics avoidance?
- ♦ Does the attitude students hold about mathematics have an effect on their achievement in mathematics courses?
- ♦ Does student achievement in mathematics courses shape their attitude towards mathematics?

- ♦ Does gender play a role in mathematics avoidance?
- ♦ What can I do to help change negative attitudes about mathematics?

Review of Literature

By the time students reach early adolescence, some have already begun to withdraw effort, resist novel approaches, and avoid seeking academic help when they need it (Turner, Midgley, Meyer, Gheen, Anderman, Kang, & Patrick, 2002). Most of the time these avoidance strategies are used to draw attention away from a low or lacking ability, undermine performance, and devalue learning (Turner, Midgley, Meyer, Gheen, Anderman, Kang, Patrick, 2002). Self-acceptance has been suggested as the highest human priority (Covington, 1992). In the classroom setting, much emphasis is put on students' grades as a way of measuring their achievement. High achievement and high ability are represented by higher grades, while lower grades suggest lower achievement and lower ability. Therefore, when students earn lower grades, they may see themselves as unworthy or unable to perform tasks. Because of this determination, students who are not certain about their ability may develop avoidance strategies in order to protect their self-worth (Turner, et al., 2002).

Many students consider asking for help to be a threat to their self-worth, both from teachers and classmates (Turner, et al., 2002). It has been found that students between the ages of 10 and 12 are least likely to ask for help when they are uncertain about their competency (Turner, et al., 2002). This is a troubling revelation to a mathematics teacher because many fundamental principles of mathematics are developed during this period of a student's life. Can anything be done within the classroom to make students feel more comfortable asking for help, which will reduce the use of avoidance strategies?

Students may receive various messages from teachers as the purpose for achievement (Maehr & Midgley, 1996). Two of the messages are based on the performance goal structure and the mastery goal structure. The performance goal structure focuses on demonstrating ability and outperforming others as reasons for academic achievement, while the mastery goal structure focuses on understanding, intellectual development, and improvement (Turner, et al., 2002). In classrooms where the performance goal structure is used, students are not as likely to ask for help (Ryan, Gheen, & Midgley, 1998), and tend to use avoidance strategies more since competition is valued, which can result in student failure (Turner, et al., 2002). Rather than attempting a challenge, students will avoid the tasks, altogether, to ensure they do not lose self-worth. However, in classrooms that apply the mastery goal structure, students feel less threatened because learning and understanding are promoted, rather than competition. Therefore, students in classrooms that have adopted the mastery goal structure see less of a need to use avoidance strategies (Turner, et al., 2002).

A teacher's attitude and communication to his or her students also plays a role in how students feel about their achievement, and, in turn, whether they are more likely to develop an avoidance strategy. Students who perceive their teachers as supportive of their learning process are less likely to develop an avoidance behavior (Turner, et al., 2002). Conversely, students who perceive their teachers as nonsupportive feel that they cannot and will not ever be able to accomplish the task, and, in turn, may develop avoidance behaviors to save their self-worth (Turner, et al., 2002). However, the support of teachers is not the only motivation that can have an effect on a student's perception and/or success in an academic course. For instance, family and peer attitudes can influence a student's

attitude towards mathematics, which can have an effect on their achievement in mathematics (Stuart, 2000). Gender and ethnicity also play a role in forming a student's attitude, but not because one gender or ethnicity is more able than the other, but because of a preconceived attitude toward the gender or ethnicity (Tobias, 1978).

Studies have shown that males have reported mathematics anxiety less than females, and have greater success in mathematics than females (Levine, 1995). This is especially true in the middle and secondary grades (Levine, 1995). However, females reportedly have better performance in mathematics in the classroom than do males (Levine, 1995). Why do males, overall, tend to do better in, and have less anxiety about, mathematics?

Part of the problem is the idea that society holds that mathematic-oriented careers are structured more for males than for females (Levine, 1995). Males are encouraged to succeed in mathematics, while females are often discouraged from pursuing a job that involves mathematical skills (Levine, 1995). This stereotype is engrained in students at a young age, and plays a part in the development of their attitude towards mathematics. A study by Chouinard, Vezeau, and Bouffard (1999) revealed that females not only experience a higher level of math anxiety, but also consider themselves less competent than males.

Distinctions between expectations of males and females in mathematics are not just a problem with society. According to Levine (1995), quoting AAUW (1992) and Sadker and Sadker (1994), studies have shown that males often receive more attention than females in the classroom. Also, females receive less criticism (Levine, 1995). Therefore, when they are criticized, it is not taken lightly, which may cause female

students to shy away from participating in class as often as males, for fear of failure (Levine, 1995).

When students do not do well, or are expected to not do well, their self-confidence is lowered. Conversely, when students succeed, not only does their self-confidence improve, but they have more satisfaction and enjoyment in that particular area. In a survey taken by Vanessa Stuart, students responded that their best subject was the one they enjoyed the most and the one in which they received the most success (Stuart, 2000). A correlation exists between the enjoyment of mathematics and student success in mathematics (Marsh & Tapia, 2002; Stuart, 2000). Those who dislike mathematics believe they are not good at it, and become nervous when mathematical tasks are placed before them (Stuart, 2000).

Mathematics anxiety often interferes with the mathematics learning (Blaszczynski & James, 2002). What are some practices mathematics teachers can put into place in the classroom to encourage student learning of mathematics, and help form positive attitudes about mathematics? According to Stuart, The National Council of Teachers of Mathematics suggests the following (Stuart, 2000):

- ♦ Accommodate different learning styles.
- ♦ Create a variety of testing environments.
- ♦ Design experiences so that students feel positive about themselves.
- ♦ Remove the importance of ego.
- ♦ Emphasize that everyone makes mistakes.
- ♦ Make math relevant.
- ♦ Empower students by letting them have input into their own evaluations.

- ♦ Allow for different social approaches.
- ♦ Emphasize the importance of original quality thinking rather than manipulation of formulas.
- ♦ Characterize math as being a human endeavor.

Mathematics anxiety has been described by Tobias as a feeling of “sudden death” in which students feel that everyone around them is aware that they do not understand (Tobias, 1978). Students do not want to draw attention to themselves by asking for help, therefore, leading them to adopt avoidance behaviors. Mathematics anxiety and avoidance are serious issues, and need to be addressed by mathematics teachers. If left unaddressed, the behaviors will only worsen as the student progresses.

Data Collection and Results

Data Collection

This study will contain the collection of both qualitative and quantitative data. However, the primary form of data collection will be qualitative. The data will consist of student surveys and questionnaires, which will be given to students at various times during the study, participant observation, and passive observation. At the beginning of the study, the students will be given a questionnaire that will focus on the students’ feelings towards mathematics, in general. (See Appendix A.) These results will be used to determine how much mathematics avoidance exists within the class, and if the avoidance possibly stems from past success or failure in mathematics courses.

The next data collection information will be taken from a survey given to the students while the study is in progress. This survey will measure the students’ attitudes towards using real-life applications in the mathematics course. (See Appendix B.) These

results will help to determine if the method of using real-life applications in the mathematics classroom should continue, and, if so, if the amount used should be increased, be decreased, or remain the same.

Another form of qualitative data that will be used throughout the study is participant observation (myself) and passive observation (sponsoring teacher). Field notes will be taken daily for future reference, and to capture any atypical characteristics of the students. The thoughts and suggestions of the passive observer will be consulted regularly. This feedback will be used to help recognize any modifications that may need to be made in order to make the study more effective.

Although it will not be the primary type of data used in this study, quantitative data will be collected. At the beginning and end of this study, students' knowledge of the content will be evaluated through use of a pre-test and post-test. Scores will be compared to determine if there was any academic achievement that resulted from using real-world applications in the mathematics classroom.

Validity, Reliability, Generalization, and Ethical Issues

Validity of the data will be established by accurately collecting my data. Detailed, daily field notes will be taken to have persistent observation, and will serve as a reference in the future. Surveys and questionnaires will be used, along with participant and passive observation, so overlapping methods will be used for comparison. Also, the thoughts and suggestions of other members of the team will be consulted, so feedback will be received and accepted throughout the study.

Reliability of the data will be established by ensuring the descriptive accuracy of observations. In order to this, regular meetings will take place to resolve any existing

differences between the participant observer (myself) and the passive observer (sponsoring teacher). Though it seems that, by making students aware of how they can use subject matter in the real world, they will be more inclined to learn and have a better attitude toward the subject, this method would need to be studied in various subject areas and grade levels before it could be generalized. Therefore, the purpose of this study will be clearly stated at the beginning of the study, and, again, when the study is completed, so that it is evident the results are relative to a fifth-grade mathematics classroom only.

Ethical issues will have to be addressed. This study is being conducted, not to undermine any existing teaching method, but to evaluate the use of an experimental method that may help form more positive attitudes about mathematics and enhance student learning. First and foremost, a team relationship will need to be developed by members of the study, especially between the researcher (myself) and the sponsoring teacher. The sponsoring teacher must not feel that his or her teaching is being belittled or criticized. The involvement of the sponsoring teacher is crucial, and will be encouraged. Regular meetings will be scheduled to discuss any conflicts, and to evaluate the progress of the study.

Negotiations

In order to conduct my action research project, some negotiations will have to be made. The first negotiation will involve the sponsoring teacher. I will need his or her approval to try new and various activities in her classroom. I will make the point that I would like to try these activities out of curiosity, not because I think his or her current teaching method is inefficient. This is likely to be my most challenging negotiation. Next, I will need to negotiate with the principal to provide the resources needed to complete the

project. Without the proper resources, the study cannot be completed as efficiently. I will also need to receive permission from parents of the students being studied, in order to gather anonymous data used for research purposes.

Methodology

The purpose of this action research project is to determine what can be done, as a teacher, to change the negative attitude many students have towards mathematics and enhance learning of mathematics. For this study, an experimental teaching strategy will be used that involves making students aware of how mathematics is used in the real world, and helping them realize that learning mathematics is necessary. Hopefully, students will realize there is a purpose for mathematics in everyday life, and will have a better attitude towards mathematics, and will be more receptive to learning mathematics.

This study will be done within a fifth-grade mathematics classroom. Students will be taught curriculum using a method that involves students working with mathematics using real-world scenarios. This effort will attempt to make students aware of how mathematics is used in everyday life, and that there is a purpose for requiring mathematics education. By helping students apply mathematical concepts to situations to which they can relate, the effort will also attempt to promote a more thorough understanding of mathematical concepts, rather than simply memorizing facts, and working problems on paper.

Pre-test and post-test results will be analyzed before and after using the real-world application method to determine if academic improvement has been made. Student surveys and questionnaires will also be completed by students and will be evaluated to determine if there has been a change in student attitude towards mathematics.

Membership

Members of the action research team, and the role they play, include the following:

- ♦ Researcher (myself): Participant observer; lesson plans/delivery, assessment of students' academic achievement and attitude.
- ♦ Sponsoring teacher: Passive observer; observe, provide feedback and suggestions.
- ♦ Selected mathematics students: Answer questionnaire and survey, participate in lessons.
- ♦ Principal: Promote research project, provide needed resources.
- ♦ Academic advisor and IRB: Permission to do the project.

Results

Pre-test and post-test reflection

A mathematics unit was taught to 22 fifth-grade students which included using classroom calculators to perform five mathematics skills. These skills consisted of finding a certain percent of a given number, converting a fraction to a decimal, converting a fraction to a percent, finding the missing number in an open sentence, and rounding a number to a given place value. The students thoroughly enjoyed the unit, and it was obvious that learning was taking place. Each day, problems using the skills that had already been taught were required as morning board work, in order to reinforce the ideas and give the students more practice using their calculators.

The pre-test had proved that the concepts planned for the unit were necessary and that students would benefit from the concepts taught in the unit. Once I reviewed the pre-

test results, I felt confident about the unit I had developed. As I proceeded to teach the unit, I had students keep documentation each day of the concept we had learned, making personal notes to help them remember how to perform each operation. Students were then allowed to use this documentation on their culminating unit test and on the post-test. The findings of the post-test were reassuring, and proved that students had learned the concepts presented. Many students had mastered every concept of the material taught in the unit. Therefore, after using a method that involved students working with mathematics using real-world scenarios, results showed that student learning had occurred.

Before the implementation of real-world application of mathematics, the students were given a questionnaire that focused on their feelings towards mathematics, in general. The results showed that most students who like mathematics also perform average to above average in mathematics. The anxiety level of these students towards mathematics is minimal to average, and is comparable to any other subject in which they perform. My observations, along with those of my cooperating teacher, were in agreement with the data found in the questionnaires. The attitude of students who performed average to above average in mathematics was much more dynamic than those who do not perform as well in the subject area.

Many students who revealed that they dislike mathematics actually perform about average in mathematics. However, they revealed that they are usually very nervous on mathematics exams and cannot concentrate very well. Their level of anxiety, in comparison to other subject areas, was much greater in mathematics. My observations gathered during this study were supportive of the data found, but, in addition to the

anxiety level of these students, I noticed that their frustration level also increased, which often resulted in the students wanting to give up on completing the task at hand. Overall, the data gathered from the questionnaire supports the idea that students who perform well in mathematics tend to have less anxiety about mathematics.

During the midpoint of the study, a survey was given to determine if a change in attitude towards mathematics had occurred, if a change in understanding had occurred, and if the students would like to continue using real-world applications in mathematics lessons. The results of the survey were encouraging, with 57 percent of students indicating they had experienced a definite attitude change toward mathematics and 7 percent indicating they had experienced some change. Even more positive results were that 79 percent of students claimed to have had a change in understanding. When asked if the student would like to continue using real-world applications of mathematics, 93 percent of students answered affirmatively. (See Figures 1 and 2.)

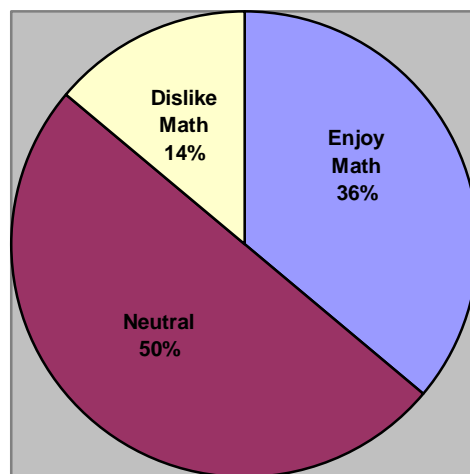


Figure 1. Attitudes towards mathematics prior to implementation of real-world application method.

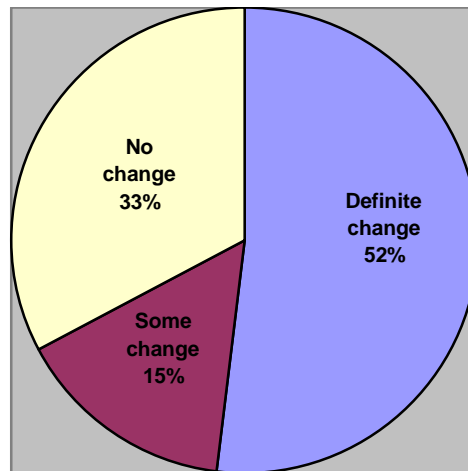


Figure 2. Attitude change after implementation of real-world application method.

Conclusions and Recommendations

Conclusions

I observed many transformations of attitude and understanding during the implementation of using real-world application of mathematics. While it cannot be generalized that using more real-world application will positively impact every student by changing the attitude of mathematics for the better and decreasing mathematics anxiety, the study did reveal that most students responded positively to the concept and enjoyed participating in a different way of learning and applying mathematical concepts.

As mentioned earlier, one of the suggestions made by the National Council of Teachers of Mathematics to encourage student learning of mathematics and help form positive attitudes about mathematics is to make math relevant. I feel that the study I conducted made mathematics real to the students and helped them to realize how mathematics skills are required and used in everyday life. The students were able to relate what they were learning in the classroom to experiences that may occur in their future for which these skills would be applicable.

Recommendations

As professional development, I would encourage teachers to try using more real-world applications and connections in their classrooms, especially in the area of mathematics. When one can make a connection with material, he or she is much more likely to retain the information and apply it to everyday life. Because of this, I predict that the use of real-world applications would be successful and create positive results for any subject matter.

One simple way that teachers can integrate real-world applications into the classroom is through the use of technology. Many learning programs are available online, at no cost to the educator. These programs should be accessed and taken advantage of by the teacher as an interactive, real-world learning tool. Students in my study were allowed to use technologically-enhanced calculators, and it was obvious, to me, that the use of the calculators increased the enthusiasm of the students.

As a continuation of this study, I would like to examine if the grade level of students would have any impact on the success or failure of using the real-world applications to promote learning and encourage positive attitudes about mathematics. For example, would using the real-world application method with high school students have more, less, or the same impact on student achievement and attitude about mathematics than that of middle school students? There is grant money available for research in mathematics education. The National Council of Teachers of Mathematics offers grants and scholarships through the Mathematics Education Trust (MET), which supports mathematics teaching and learning. MET supports efforts started by teachers that aim to benefit all students. The goal is to provide current and future teachers with resources to

improve mathematics in the classroom. This funding could provide resources that would allow a future study to be performed more extensively, giving results that may be able to be generalized across grade levels of mathematics, and, perhaps, even other content areas.

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Appendix A

Student Questionnaire

I am conducting a study on what I can do as a future mathematics teacher to help develop positive attitudes towards mathematics, and enhance student learning of mathematics. Please answer the following questions using the scale below. Your participation would help me with my research study. Please do not write your name on this paper. Thank you.

1) How would you describe your overall attitude about mathematics?

- a) I enjoy mathematics.
- b) I neither enjoy nor dislike mathematics.
- c) I dislike mathematics.

2) How would you describe your success in past mathematics courses?

- a) I have done well in mathematics.
- b) I have done average in mathematics.
- c) I have not done very well in mathematics.

3) How would you describe your feelings before a mathematics test?

- a) I usually feel quite calm.
- b) I have an average amount of nervousness.
- c) I am usually very nervous and cannot concentrate very well.

4) How would you rate your feelings before a mathematics class to your feelings before a test in another class?

- a) I do not get nervous before tests.
- b) I have about the same amount of nervousness for all types of tests.

c) I am much more nervous before a mathematics test than before other tests.

Appendix B
Student Survey A

I am conducting a study on what I can do as a future mathematics teacher to help develop positive attitudes towards mathematics, and enhance student learning of mathematics. If you would please answer the questions below, it would help me with my research study. Please do not write your name on this paper. Thank you.

- 1) Has there been a change in your attitude towards mathematics since we have begun using more real-world application of mathematics in this course?

- 2) Do you feel there has been any change in your understanding of mathematical concepts since we have begun using real-world application of mathematics in this course?

- 3) Would you like to continue using real-world application in this mathematics course? If so, would you like to use it less or more?

- 4) Is there something you feel could be done differently to make your experience in this course more enjoyable? If so, please explain.

Rhythm and Rhyme—The Effects of Music on Vocabulary Development
of Kindergarten Students

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Education 590, Spring 2007

The University of Tennessee at Chattanooga

*The Institutional Review Board of The University of Tennessee at
Chattanooga(FWA00004149) has approved this research project 07-039.*

Introduction to the Problem

The most important skill a child will ever learn is the ability to read! Research demonstrates the fact that “vocabulary is critical to reading comprehension” (Cunningham, 2006, p. 708). Therefore, vocabulary development should be a top priority for teachers. Since children, for the most part, no longer receive the rich, literary background that existed prior to television and video games, educators must be diligent in finding ways to provide this experience in the classroom. One way to actively engage children in learning vocabulary is to use music or texts that rhyme. The purpose of this research is to study the effects, if any, that music or rhythm and rhyme have on vocabulary development and comprehension in kindergarteners. Using three shared reading experiences and subsequent vocabulary activities, the investigator will assess vocabulary comprehension both before and after the experience. The first book, entitled *This is the Place For Me*, by Joanna Cole, will have no music or rhyme; the second book, entitled *Mrs. McNosh Hangs Up Her Wash*, by Sarah Weeks, will only rhyme with no music; and the final book, entitled *Down by the Bay*, illustrated by Alan Daniel, will be set to music and will also rhyme. A pre- and post-test—preferably called an assessment—will be administered with each book experience.

Review of Literature

Jim Trelease, author of *The Read-Aloud Handbook*, believes “reading aloud to children of all ages (from birth through middle school) is the most effective way to help them enlarge their vocabulary” (Yellin, Blake, & DeVries, 2004, p. 187). Vocabulary development is seen as “a natural byproduct of listening and speaking” (Yellin, et al., 2004, p. 187). Listening to family and responding to them is a trait that begins at birth.

This trait continues to help children grasp ideas and concepts. Even before children in kindergarten know how to read, they “gain their meaning vocabulary primarily through listening to and retelling stories, songs, and poems” (Cecil, 2003, p. 118). These experiences are usually enjoyable and focus on more than the skill being taught.

Educators are continuously looking for ways to develop and improve the vocabulary of emergent readers, and music can play a large role in that development. Since “children differ greatly in the size of their meaning vocabularies at school entrance,” educators have a great responsibility to do their best to increase their meaning-vocabulary development (Cunningham, 2006, p. 708). In the article entitled, *Using Song Picture Books To Support Emergent Literacy*, authors Mary Renck Jalongo and Deborah McDonald Ribblett suggest song picture books as a way to encourage literacy:

The typical young child arrives at school with a repertoire of memorized song lyrics . . . and this oral language, when supported by written texts and musical enjoyment, can become a valuable resource for reading instruction (Jalongo & Ribblett, 1997, p. 15)

Music provides an enjoyable way for students to cover more than one skill at a time. Researcher C. A. Elster (1994) says children participating in these literary experiences with singing are “involved in authentic, holistic literacy experiences, rather than task-focused instruction that breaks up reading into discrete skills” (Jalongo & Ribblett, 1997, p.16). Music is a perfect source of new terms such as those found in lyrics. Through songs, students are introduced to new vocabulary in an enjoyable way. This vocabulary may be introduced using the word and a corresponding picture before the song and referenced after the song for the most retention. Another book states

“teachers should recognize the value of expanding children’s vocabulary in the course of studying topics of interest” (Bredekamp & Copple, 1997, p. 109). Pictures or videos provide children the concepts “for things they have never directly experienced” (Cunningham, 2006, p. 709). Research on brain development and memory show the “connection between emotion and learning,” so enjoyment is a large part of learning (Bredekamp & Copple, 1997, p. 144). It is important for children to “develop the desire to read” (Bredekamp & Copple, 1997, p. 158). Choosing the correct text for enjoyment is crucial. Predictable books which “make use of repeated phrases, include rhythm or rhyme, and incorporate natural spoken language are the ones children will want to read over and over again” (Dorn, French, & Jones, 1998, p. 32). One author suggests, “young children never seem to tire of singing a catchy tune; thus, songs selected for their patterns can familiarize children with high-frequency sight vocabulary” (Cecil, 2003, p. 204-205). Most importantly, students must be “actively engaged with the reading material and must be allowed myriad opportunities to transfer and apply newly acquired words in a variety of meaningful ways” (Cecil, 2003, p. 119). Connecting meaning to words in lyrics, by using games or creative writing, allows children to enjoy and excel in their own learning.

Also important for cognitive development in children is physical activity. This activity includes physical actions to “help them grasp the idea” (Bredekamp & Copple, 1997, p. 156). During songs when children are learning vocabulary, they can be encouraged to use movements or hand signs to increase their understanding. Students can also use pointers to match a word with the corresponding picture or point out certain letters or sounds they hear within a specific word. Yet another way to incorporate physical activity into a lesson is to allow students to use their bodies to show what the

word means. One book states, “instead of always *telling* children the meanings of new words, action words can be acted out by the class” (Cecil, 2003, p. 135). Fisher believes “working over time with a repetitive song . . . provides children with many opportunities to apply skills and strategies, particularly phonemic awareness, in a variety of meaningful ways” (Fisher, 1998, p. 173). Using these experiences, emergent readers can develop strong vocabularies through repetition of words also found in the context of their illustrations. The use of activities that “demand active student involvement in vocabulary learning” is more effective than “passive fill-in-the-blank exercises” (Yellin, et al., 2004, p. 188). The main focus is to “keep meaning at the center of learning throughout the day” and “the interplay between reading, writing, speaking, and listening is natural and seamless” (Fisher, 1998, p. 170).

Educators must use this knowledge to improve their classroom instruction. One article supports the “innovative approaches to translate current research into classroom practices” (Fisher & McDonald, 2001, p. 106). As educators learn more about how the brain processes learning, they must assess their own practices and make any necessary adjustments. In the article entitled, *The Intersection Between Music and Early Literacy Instruction: Listening to Literacy*, research by J. Smith (2000) holds that literacy skills are used when the following happens:

Emergent readers hear, sing, discuss, play with, and write songs, they are building important background knowledge that they will draw upon during later reading and writing experiences. With each new song, students learn concepts and word meanings that they will encounter in print (cited in Fisher & McDonald, 2001, p. 106)

Literacy scaffolds help students find “formulas” and, therefore, focus on developing their own ideas from the example. Repetitive patterns, “such as those found in published poems or songs, can be turned into literacy scaffolds” (Cecil, 2003, p. 172). According to research by Gilles, Andre, Dye, and Pfannenstiel, students “acquire new vocabulary and are introduced to fresh content each time they sing a song” (cited in Fisher & McDonald, 2001, p. 110). When teachers use music in the classroom, it heightens “children’s understanding of new vocabulary within meaningful, active, and expressive contexts” (Fisher & McDonald, 2001, p. 110). In strong support of using music in the classroom, Fisher and McDonald say, “the time has come to make known the natural links between classroom musical activity and important instructional goals in early literacy development” (Fisher & McDonald, 2001, p. 112).

Data Collection and Results

Data Collection

Subjects

The participants include 15 students in one inclusion kindergarten classroom. Ability levels vary greatly within this group. All of the students are Caucasian, from middle-class to upper-middle-class families. Absenteeism rates are low but do affect this study: student number one is absent for the *Mrs. McNosh Hangs Up Her Wash* pre- and post-assessment, and student number eight is absent for the pre-assessment for the book, *This Is the Place For Me*. Most of the students enjoy taking part in these experiences.

Methodology

The process for this research takes several days to complete, using one book per day. The first step in this process is to give the pre-assessment. The pre-assessment is

given without any review, instruction, or assistance from the teacher, investigator, or others. The children were not allowed to help each other. After the pre-assessment, the book is read and a whole group vocabulary matching activity is completed. This activity uses the same pictures and words as included on the pre-assessment. The post-assessment is then administered using the same procedure as indicated above. The identical instrument was used as both the pre- and post-assessment for each book.

Pre-assessment of vocabulary knowledge. Each pre-assessment includes eight or nine vocabulary words chosen from the book. The words are chosen since they would be unfamiliar to the students. One or two sets of words, beginning with the same letter or sound, are chosen to find whether the children can distinguish the correct match using more clues than the first letter of the word. The students are asked to draw a line to match the vocabulary word with the corresponding picture.

Post-assessment of vocabulary knowledge. Each post-assessment is identical to its pre-assessment. The goal is to see if any improvement is made in student ability to match the correct pictures with the vocabulary words.

Recruitment and Selection Plan

Student participants will be from one kindergarten classroom at a suburban elementary school in Hamilton County, Tennessee. All permission forms are signed by the caregivers, so students participate as a whole class as a part of the normal reading instruction time.

Quality of Eligible Partners

The students will participate in three shared reading experiences. The first book will have no music or rhyme, the second book will only rhyme with no music, and the final

book will be set to music and also rhyme. A pre- and post-assessment will be administered with each book experience to compare the vocabulary development. There are no risks associated with this study. Each student will be assigned a number in order to keep the results anonymous. The only individuals with access to the names and/or data will include the principal investigator and the cooperating kindergarten teacher.

Instructional Plan and Leadership

The investigator will administer the pre-assessment. Immediately following the pre-assessment, the investigator will read the book with the whole class during a shared reading time. Then a matching game, using words and pictures from the book, and also identical to the words and pictures on the pre- and post-assessments, will be played as a group. After discussing the “clues” to find a match (such as sounding it out and looking for the correct beginning sound or letter), the post-assessment will be administered. At no time during the pre- or post-assessment will any assistance or conversation be allowed.

Time Commitments. One group of 15 participants will participate in three shared reading experiences. Each reading time, including the pre- and post- assessments and vocabulary activity, should last 45 minutes. One reading experience and vocabulary activity are used per day. This time fits in with the normal class schedule for this group of students.

Results

The first book experience shows an increase in score, averaging one or two points for most children. At this point, the process is new to the students, and they seem to try to do their best on the assessments. See Appendix A for a complete set of pre- and post-assessment results. Although this book has no music or rhymes, the children do well

matching the pictures with the correct vocabulary words. Appendix B includes the results of the assessments displayed by student number per book. Each assessment has a total of eight or nine vocabulary matches.

In the second book experience, the students enjoy a humorous, rhyming story. Of the three books, this is the only one the students ask to be read numerous times in the day. Overall, the results show a one or two point increase for many of the students. At this point, the students enjoy the story, but are less interested in the assessment.

The students truly enjoy the final book experience. They love singing along and using the pointer to match the picture with the vocabulary word during the vocabulary activity. At this point, students are not very cooperative taking the assessment. Many just scribble or leave answers blank. Although not all of the students show increases on the assessment scores, due to this fact, almost half of the class improved by two or three points. Of the remaining students, four received perfect scores on both the pre- and post-assessments. Therefore, the students show some of the most improvement on correct answers after the book with both music and rhyme.

The following learning expectations, student performance indicators established by the Tennessee Department of Education(n.d.), were met (presented numerically in Figure 1).

English/Language Arts	Kindergarten												
SPI	1.01	1.02	1.03	1.04	1.05	1.06	1.07	1.08	1.09	1.10	1.11	1.14	

Figure 1. Student performance indicators for English/language arts in kindergarten.

Conclusions and Recommendations

Conclusions

According to the results of the book experiences, music does have a positive effect on vocabulary development and comprehension in the case of these kindergarten students. One of the main reasons for this effect could be the enjoyment the students experience when music and rhyming are used together. As stated earlier, connecting enjoyment to learning helps the brain process and store new information. Since the scores for the final book show the largest individual improvements, educators can assume that music and rhyming are important tools for the classroom learning experience.

Recommendations

Professional educators agree on the importance of vocabulary development for reading comprehension, as well as the importance of allowing students to direct their own learning. All educators want their students to, not only learn information, but store that information in such a way as to build upon it as they learn more. Music and rhyme are proven ways to help students create scaffolds between prior knowledge and new information. The key to the tools of music and rhyme is enjoyment. When students enjoy what they are learning, they create permanent connections that are available for future use.

Upon the basis of this study, the investigator suggests incorporating music as a part of literacy instruction in the classroom. One way to for this idea to infiltrate the classroom is to train teachers during professional development to find innovative ways to use music in their lessons. Students of all ages enjoy music, and this enjoyment leads to meaningful scaffolds for knowledge and recalling information. Another factor in this study is rhyming. Young students especially enjoy rhyming words. Rhyming creates yet another scaffold to support the learning that takes place in the classroom. Children also

benefit from using technology in the classroom, and the ideas from this study may be adapted for use on a computer, overhead projector, or other applicable technological tool. For instance, the vocabulary activities could be set up as matching games on a computer where the students can work together to complete the matches. A resourceful teacher can be trained to adapt ideas to use music in a variety of ways in the classroom.

Music and rhyming can also be used in other areas besides literacy instruction. The importance of scaffolding and enjoyment in learning cross over subject boundaries.

Also, vocabulary is a large part of many subject areas. This study shows the positive effects of using music in vocabulary development. Therefore, music and rhyme can be used for the purpose of developing vocabulary in any subject area.

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Appendix A

Pre- and Post-Assessments

The following are the pre- and post-assessments used during this research. Each assessment includes eight or nine vocabulary words with the corresponding pictures. All matching activities used the same pictures as were included on the assessments.

This is the Place For Me

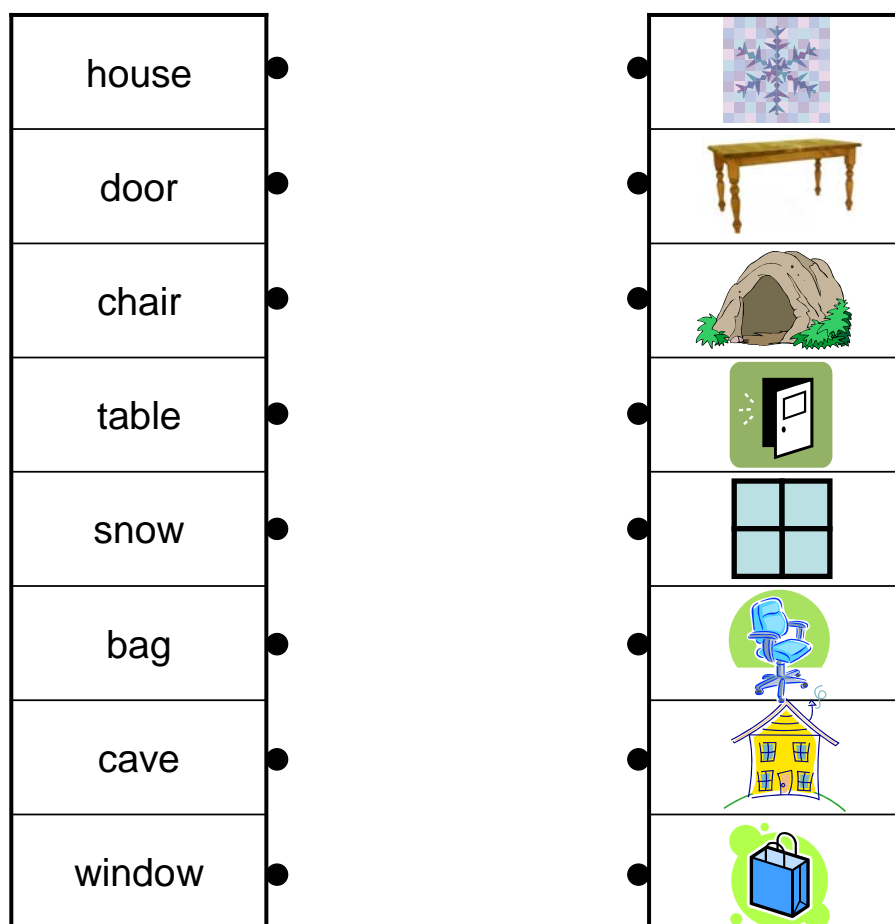











Figure 2. Pre- and post-assessment for *This Is the Place For Me*, by Joanna Cole.

Mrs. McNosh

Hangs Up Her Wash










barrel	
kite	
dress	
shirt	
shoe	
apron	
dog	
phone	
hat	

2007—Andrea Ziegler

Student #

Figure 3. Pre- and post-assessment for *Mrs. McNosh Hangs Up Her Wash*, by Sarah Weeks.

Down by the Bay

watermelons	
fly	
tie	
bear	
whale	
moose	
goose	
bay	
hair	

2007—Andrea Ziegler

Student #

Figure 4. Pre- and post-assessment for *Down By the Bay*, illustrated by Alan Daniel.

Appendix B

Assessment Results

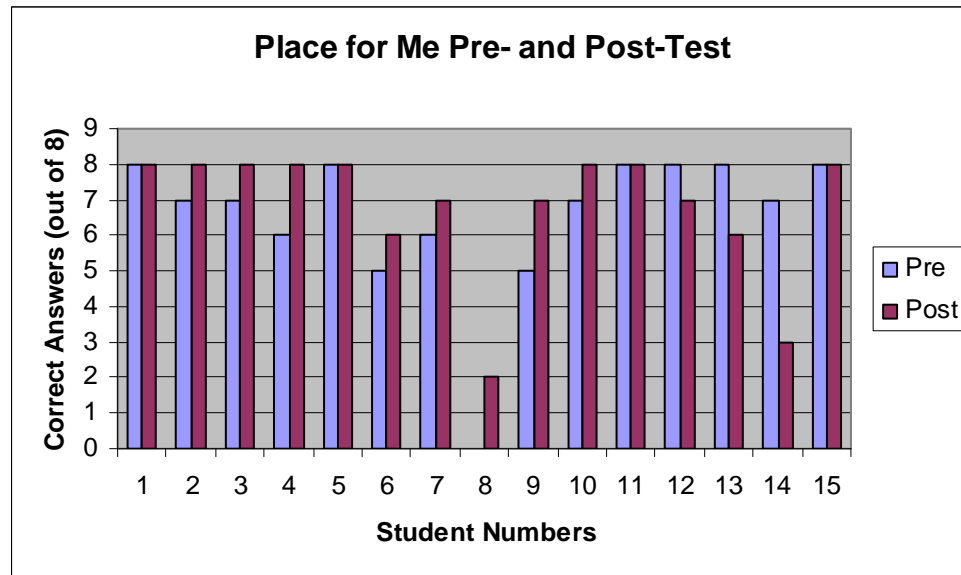


Figure 5. Pre- and post-assessment results for *This Is the Place For Me*, by Joanna Cole (eight total possible points).

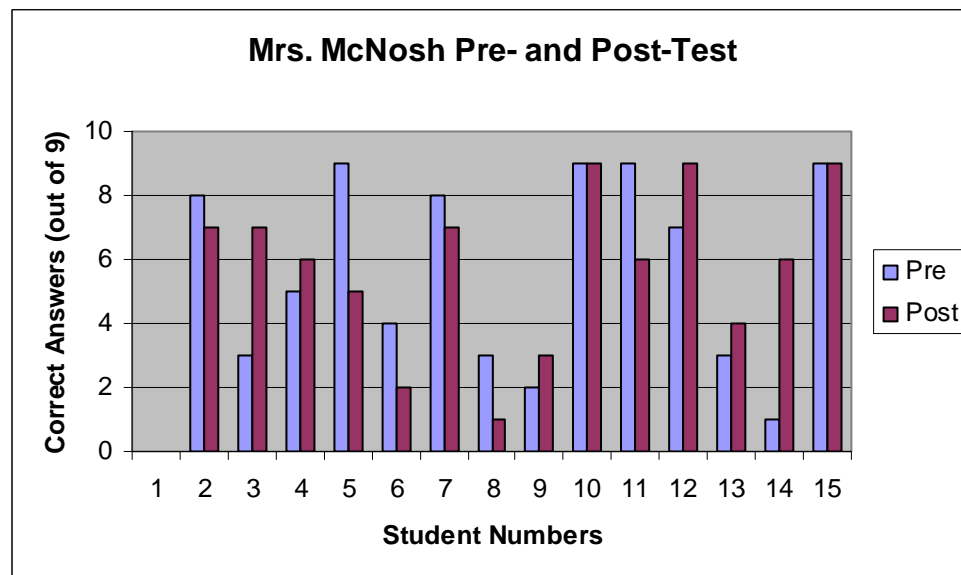


Figure 6. Pre- and post-assessment results for *Mrs. McNosh Hangs Up Her Wash*, by Sarah Weeks (nine total possible points).

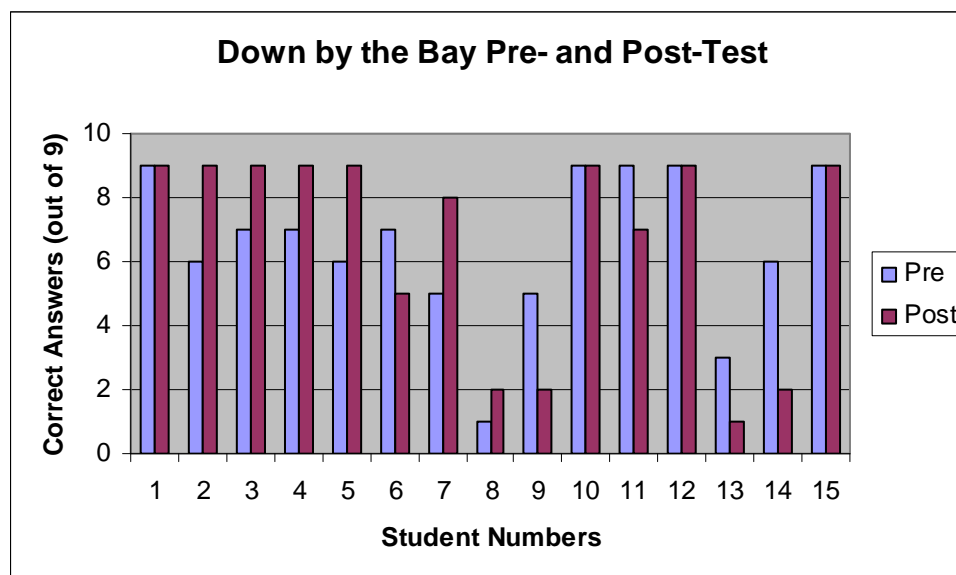


Figure 7. Pre- and post-assessment results for *Down By the Bay*, illustrated by Alan Daniel (nine total possible points).